

Issue 079 March 2012

Cover image by Jose Alves da Silva

Carlos Ortega

3D Character Artist

Gallery Artist

Gallery - 10 of the best images from around the world!

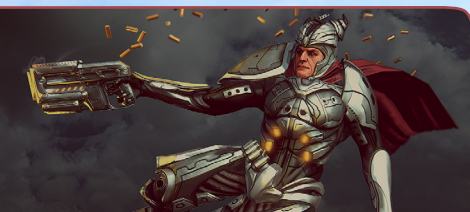
Rallypoint - Outer Rim

Project Overview by Tamás Gyermán

Armored Beasts

Top of the **pecking** order this month, and making its way onto our **eggsellent** cover, is this fantastic image by **Jose Alves da Silva**.

THE ARMORED BIRD CATCHES THE WORM!



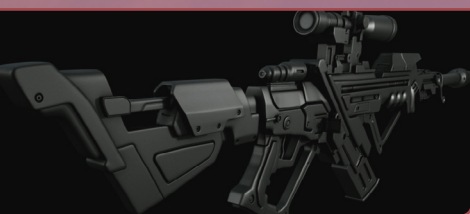
Sword Master 2

In the final installment **Gavin Goulden** talks us through how to set up the render and present our cool low poly models.



Spy Snail

Andrzej Sykut wraps up his amazing Cyborg's series by explaining the creation of his brilliant spy snail image.



Topology

Diego Maia concludes his guide to achieving clean topology by talking us through how to model hard-surfaces.



EDITORIAL

Hello and welcome to the 79th issue of 3DCreative. I don't know about where you are, but we are just starting to get some glimpses of spring and the coming warmer weather here in the UK. Many would say that it is an inspirational time of year and perhaps time to take on a new project. Well if

a little spark or direction is what you are after there is no need to look any further than this month's 3DCreative!

Top of the PECKING order this month, and making its way onto our EGGSELLENT cover, is a fantastic image by a regular contributor to 3DCreative, **Jose Alves da Silva**. We thought it would be nice to break up our aggressive-looking ZBrush Armored Beasts series by throwing in a little humor, and the first name that came to my head to do that for us was Jose's. Jose doesn't just share parts of his process with us, but walks us through every step he went through to create his stunning image, so if ZBrush is your program of choice you really must give this a go.

Before I start making more bad jokes I will move on to talk about our Swordmaster series. I really hope you guys have been paying close attention to all the amazing advice that **Gavin Goulden** has given us in this amazing series. In the final installment he talks us through how to set up the render and present our cool low poly models to impress potential employers and clients. Gavin has done a great job and we are really grateful for all of his hard work. In next month's magazine we move onto something new to 3DCreative: FX Particles and Dynamics!

In fact, this month's magazine is full of goodbyes. We also say a fond farewell to **Andrzej Sykut**, who wraps up his amazing Cyborg's series with a brilliant spy snail. I have really loved everything that Andrzej has done, but this image has to be my favorite from the series. You know someone has done a good job when it becomes hard to tell where the 3D finishes and the photograph starts, and this is definitely the case with this fantastic image. Next month we will be starting a great new series about using concepts to create great models of droids, so stay tuned!

Another series that is drawing to an end this month is our Topology series by **Diego Maia**. Diego concludes his guide to

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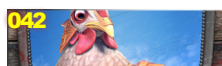
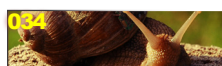
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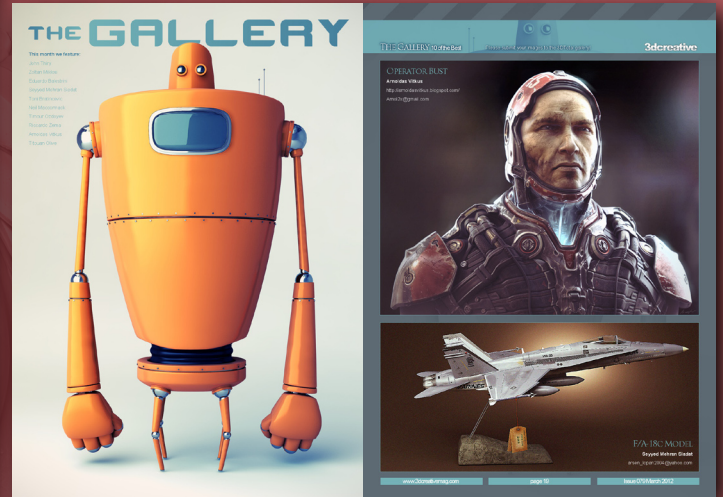
achieving clean topology by talking us through how to model hard surfaces. The new series to replace this will be totally different as we learn how to model a realistic head in 3ds Max and Maya.

I'm swiftly running out of space so I will just quickly remind you to take a look at the interview with cartoon king Carlos Ortega, the Making Of by **Tamas Gyerman** and the stunning gallery featuring work by **John Thiry**, **Neil Maccormack**, **Titouan Olive** and many more.



Get the most out of your Magazine!

If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!



SETTING UP YOUR PDF READER

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: [DOWNLOAD!](#)

To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the **VIEW** menu, then **PAGE DISPLAY**;
3. Select **TWO-UP CONTINUOUS**, making sure that **SHOW COVER PAGE** is also selected.

That's it!

CONTRIBUTING ARTISTS

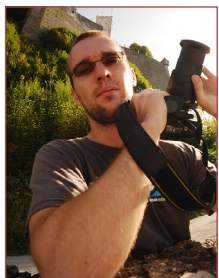
Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in the 3DCreative magazine, please contact: simon@3dtotal.com



GAVIN GOULDEN

Gavin Goulden is a character artist for Irrational Games working on Bioshock Infinite. With 6 years games industry experience, he has contributed character and environment art assets to multiple titles including Dead Rising 2, The Bigs 2, Damnation and FEAR 2.

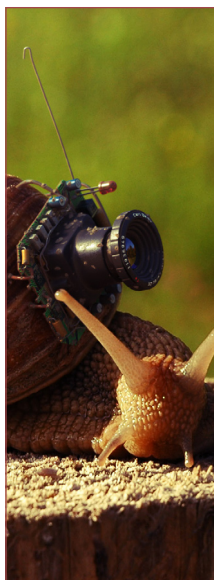
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ANDRZEJ SYKUT

When it comes to CG, Andrzej is a bit of a generalist, but lighting is where the fun is for him – that, and post-production/

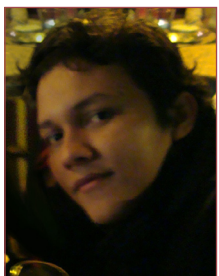
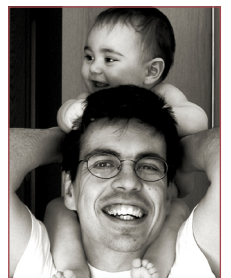
compositing. He currently works at Platige Image, and also does some freelancing as well. While he enjoys his work, it's also time-consuming, so he tries to get away from the computer as often as possible to enjoy the world. <http://azazel.carbonmade.com/>
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JOSE ALVES DA SILVA

Jose Alves da Silva has been working in the 3D field for over 15 years. Jose has a degree in Architecture but now works as a full time freelancer dedicated to his true passions - character creation and illustration. This has given Jose the opportunity to work on some spectacular projects in the feature film, advertising and gaming industries.

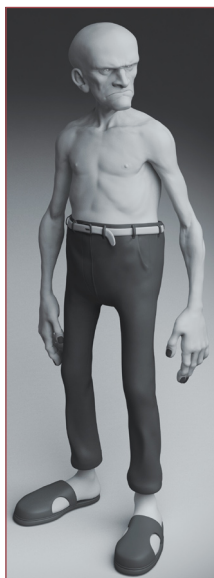
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DIEGO MAIA

Diego Maia is a freelance 3D modeler and concept designer from Brazil. He has worked for some of the biggest advertising companies in Brazil, and has also been teaching drawing classes at Melies School for three years.

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WOULD YOU LIKE TO CONTRIBUTE TO 3DCREATIVE OR 2DARTIST MAGAZINE?

We are always looking for tutorial artists, gallery submissions, potential interviewees, 'making of' writers, and more. For more information, please send a link to your portfolio, or send examples, to: simon@3dtotal.com

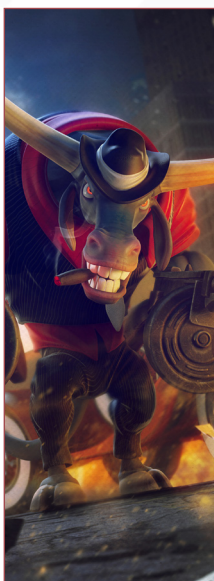


CARLOS ORTEGA

A graphic designer who has been working in 3D for about 4 years now. He's currently working in the TV department

of Guanajuato University doing motion graphic design and 3D animation for TV spots and documentaries. He's also a 3D & multimedia freelancer and a short film hobbyist at a production house called TG Productions.

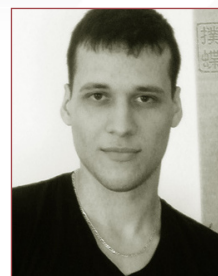
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TAMÁS GYERMÁN

Tamás Gyermán is a fan of all space and fantasy art. Above all he likes to create spaceships and grand space-scenes. He always uses powerful colors and contrasting lights in his images.

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Cyborgs - Spy Snail by Andrzej Sykut



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image by Konstantin Kryukov



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Vue image by Kazuya Hashimoto (winner of the 3D Environment Competition 2011)



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CARLOS ORTEGA

Carlos Ortega is an incredible artist and in our latest interview he chats to us about how using software such as ZBrush, Maya and Mudbox has brought out his love and passion for 3D design. He also shares how he has grown up surrounded by digital art, and how a good color palette can make all the difference...



"AS WITH EVERYTHING IN THIS FIELD, GOOD PLANNING AND A GOOD WORKFLOW HELPS YOU TO SAVE A LOT OF TIME AND AVOID COMMON ERRORS"

Hi Carlos. I have been trying to do a little research into your background and training and although I couldn't find much I did see that you have a huge skill set and have experience in quite a few fields. How did you become interested in CG and how did you end up in your current employment?

Hi Simon! First of all, thanks for taking your time in doing this interview, I'm very flattered and excited to share a little bit of my personality and my passion. One of the first things I remember that got me interested in CG was the first time I saw *Jurassic Park* at the cinema as a kid. I've always been a big fan of dinosaurs and that moment was a milestone for what I wanted to do with my life, so despite the fact that I always wanted to be a paleontologist, I decided to study graphic design. I forced myself to learn how all those amazing VFX, dinosaurs and video game cinematics were done, and be able one day to do something similar myself.

My first job involved web pages and multimedia development, but as a hobby I learned CarraraStudio, just for fun. That would lead later to getting a full time job at the university in my town, thanks to a friend's recommendation. As a fun fact, my first paid job was to model and animate a bunch of dinosaurs for a paleontological exhibition running in my town. It was the best way to blend two of my biggest passions in one project.

After a couple of years using CarraraStudio I decided to learn Maya and improve my skills as a 3D artist.





Ha, I love *Jurassic Park* too! The CG in that film differs in style to most of your work, in that your work is more stylized and cartoony.

Do you ever think about taking on realistic projects like the dinosaurs in *Jurassic Park*?

Sure, I think about it most of the time, one of the many things I would love to master is digital set extension, which is one of those areas nobody notices when it is perfectly done. It's funny because I admire and enjoy a well-done, realistic scene, but I grew up with Disney, Hanna Barbera, Chuck Jones and Looney Tunes, Filmation etc., so as far as personal work goes most of mine involves cartoons [Laughs]!

One of the things about being a 3D generalist artist is that it involves tons of different disciplines, one of these being photorealism. I think it is fundamental to know how a realistic lit scene or character works and looks like. As a freelancer I've had some projects involving realistic scenes, and from start to finish, I always learn a bunch of technical but important stuff that I end up using on every new project if required, even if it involves just cartoons.





With your love of *Jurassic Park*, do you hope to work in the film industry at any point in the future? If you do, what kind of film would you like to work on?

Of course! I think it has been one of my biggest dreams. When I watch a good movie, I not only get moved by a good VFX scene, a fantastic creature or charming cartoon acting, but I also get moved by all the talented and passionate artists that are behind all those incredible scenes. That is the reason I always watch the whole credits after a movie! I would love to work on an animated feature; it is incredible to see what a good animated movie can convey to a child or a grown-up guy like me, in just a single scene, through its characters. I would love to be able to convey that feeling myself through my work someday.







I notice that you use both Mudbox and ZBrush. How would you compare the two programmes? And do you have a favorite?

I tried both packages when I decided to get into digital sculpting. I started with ZBrush because of my hardware limitations; it was a bit difficult at first to get used to the interface, but it ended up being a very noble application. Later I tried Mudbox just to develop my skills and I fell in love with the application. Right now, I would say Mudbox is my favorite, mostly because of its texturing capabilities and intuitive interface, and I feel it is better integrated with Maya. But honestly, both applications are great and can make the same things in the end. It is all about finding the best tool to achieve the desired goal, and the one you feel more comfortable working with – it's the same for Max/Maya, Photoshop/ Painter, Corel/Illustrator etc. As I always say, all the magic comes from the guy or the girl behind the keyboard and the monitor.



How do you go about planning one of your cartoon character images? Do you start by sketching a few ideas before you begin modeling or do you go straight into 3D?

A little bit of both. With most of those born directly into the 3D viewport, I usually drop a cube or a plane in, and ideas and volumes start to flow. With some personal projects, when I come up with a new idea, sometimes I allow myself to make something on paper, but I prefer to go straight into 3D. But as with everything in this field, good planning and a good workflow helps you to save a lot of time and avoid common errors.

It always amazes me how 3D artists use their 3D software as a way of sketching and generating ideas. What technique do you use to generate ideas in 3D and do you find it easier to do this kind of idea-generating work in Maya or Mudbox?



In my case, I feel more comfortable sketching in 3D directly in Maya. If you get a nice and readable silhouette with a blocky base mesh and a bunch of primitives, I feel more confident it will work when in full detail. But on the other hand, sometimes I sketch directly in Mudbox using the default base meshes or one of the many unfinished ones I have. Once you've learned to work with technical constraints, it feels good to have more freedom and spend more time on the creative process, and that is one of the many advantages, I find, to having a sculpting application near you.

I was taking a look through your favorites on Deviant Art and found a surprising amount of 2D work and digital paintings. Do you ever venture into this kind of work?

Yes, 2D is something I grew up with, and my love for drawing led me to try several traditional



techniques, from pencils and charcoals to oils and watercolors. It is a discipline I admire a lot, from classical painting to comic strips. I still use the long render times to sketch and capture ideas on paper.

Regarding digital painting, I have a good amount of unfinished work on my computer. It is not my strongest area, but is a good way to refresh myself from 3D jobs. Some of those paintings start with sketches on paper; others directly inside Photoshop. The bad thing about me is that at some point I decide to make them in 3D and that is the moment they become unfinished work because I don't finish them in 2D or in 3D. I guess it's a bad habit I need to get rid of!

I think every artist struggles with the frustration of not always having enough time to see every idea through to a completed image. Do you ever get an opportunity to develop your personal ideas in your day job? If not, do you find that you are working in 3D morning and night?

Well it is a mix of both, really. Sometimes I can develop personal ideas, but even with that freedom, sometimes I prefer to develop

someone else's idea; in some cases it makes things go faster. And lately, I do work in 3D almost all day and all night actually, but a very small part of that time feels like an actual job. I've learned to enjoy all the stages of a project, even the frustrating ones, such as long render times and last minute changes (OK, no, I'm still struggling trying to enjoy those last ones!)

One of the things I love about your work is that you use great eye-catching colors that make your images stand out and catch the viewers' attention. How do you choose the color palette?

Hey, thanks! Well, it is hard to explain. There is some kind of synesthesia going on there [Laughs], but yes, color and atmosphere is one of the things I always pay special attention to. Sometimes they're based on references, sometimes as pure personal taste and sometimes on previous experiences. Most of the time, I choose the color palette at the same time that I come up with a new idea or when the client gives me a small brief of the desired work, even when I still don't have an idea of how the final elements will look. Of course, sometimes I end up changing things, but I always try to have two or three harmonic colors well distributed in the scene. It helps to keep the image balanced and avoid a noisy look, and most people usually sub-consciously remember movie scenes or images by naming a predominant color. I always



recommend having a wide visual culture and at least the basics of color theory; it can be very helpful to define aspects such as the character's attitude and background history, and the mood of the scene.

Is there anything you like to do in your spare time that helps you to generate ideas, and if you weren't a 3D artist, what would you be doing?

Oh yes, whenever I have the chance, I'm a very quiet person with simple pleasures and hobbies. Sharing a beer or a cup of coffee with

friends, listening to music, reading, quick trips out of town to enjoy nature... these are some of the things I enjoy most. Along with my daily experiences, they are the perfect source of inspiration and kind of a "reset button" to refresh myself and grab motivation for the next waves of work.

Thanks for giving us time to catch up with you, Carlos.

Thank you Simon, for your huge patience in this interview!

CARLOS ORTEGA

For more from this artist visit:

<http://www.zigrafus.com.mx/>

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Interviewed by: Simon Morse



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THE GALLERY

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John Thiry

Zoltan Miklosi

Eduardo Balestrini

Seyyed Mehran Siadat

Toni Bratincevic

Neil Maccormack

Timour Ozdoyev

Riccardo Zema

Arnoldas Vitkus

Titouan Olive

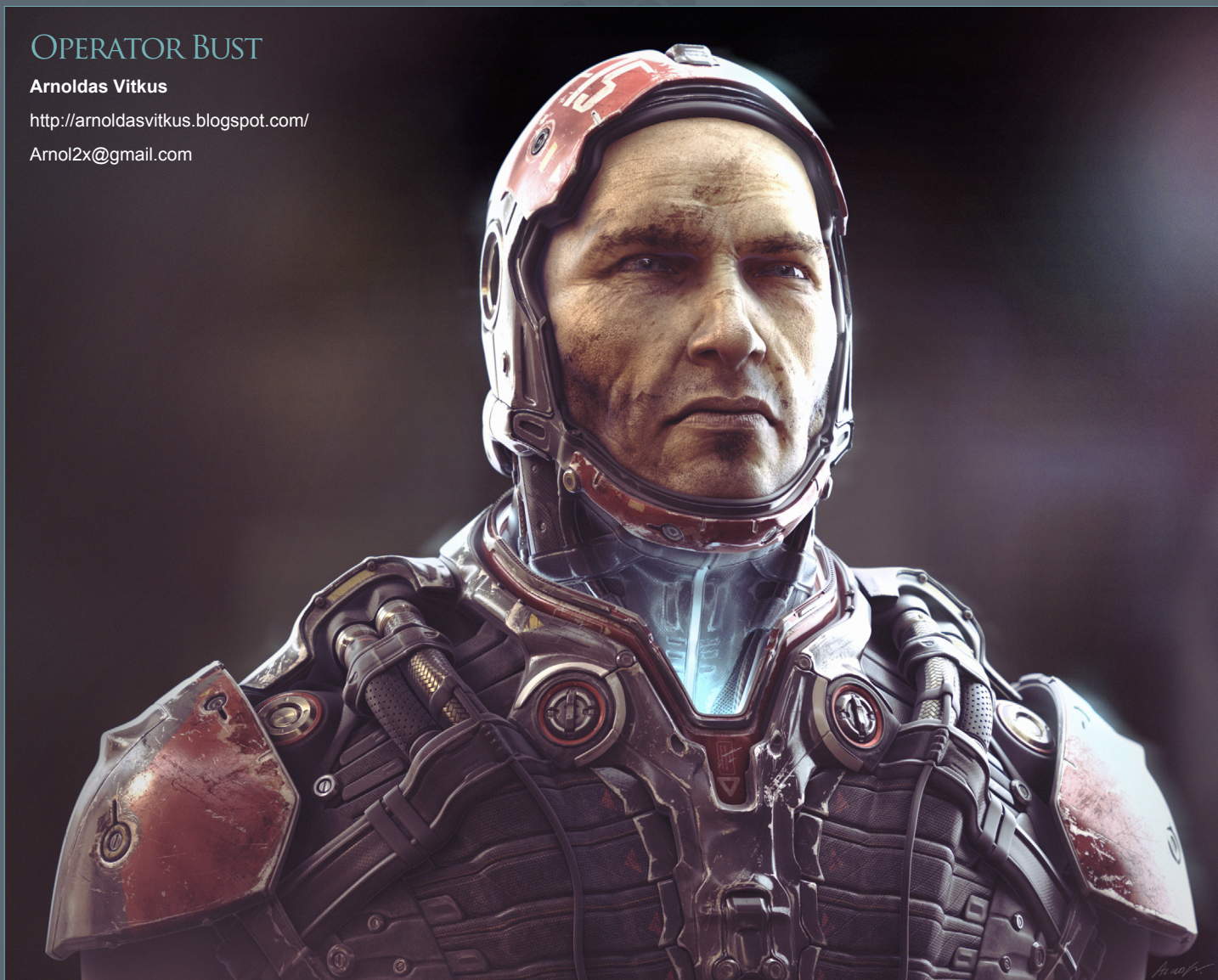


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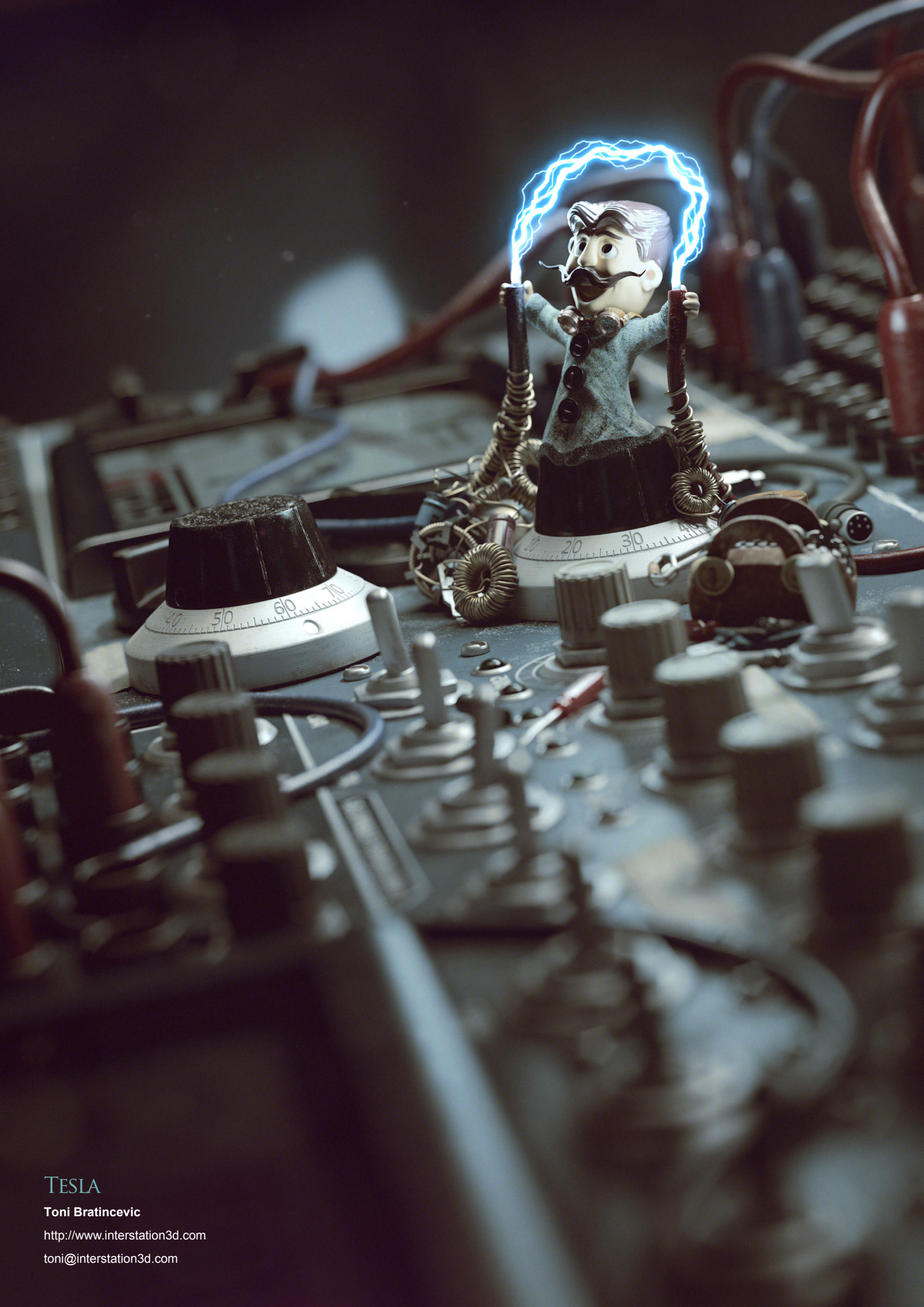
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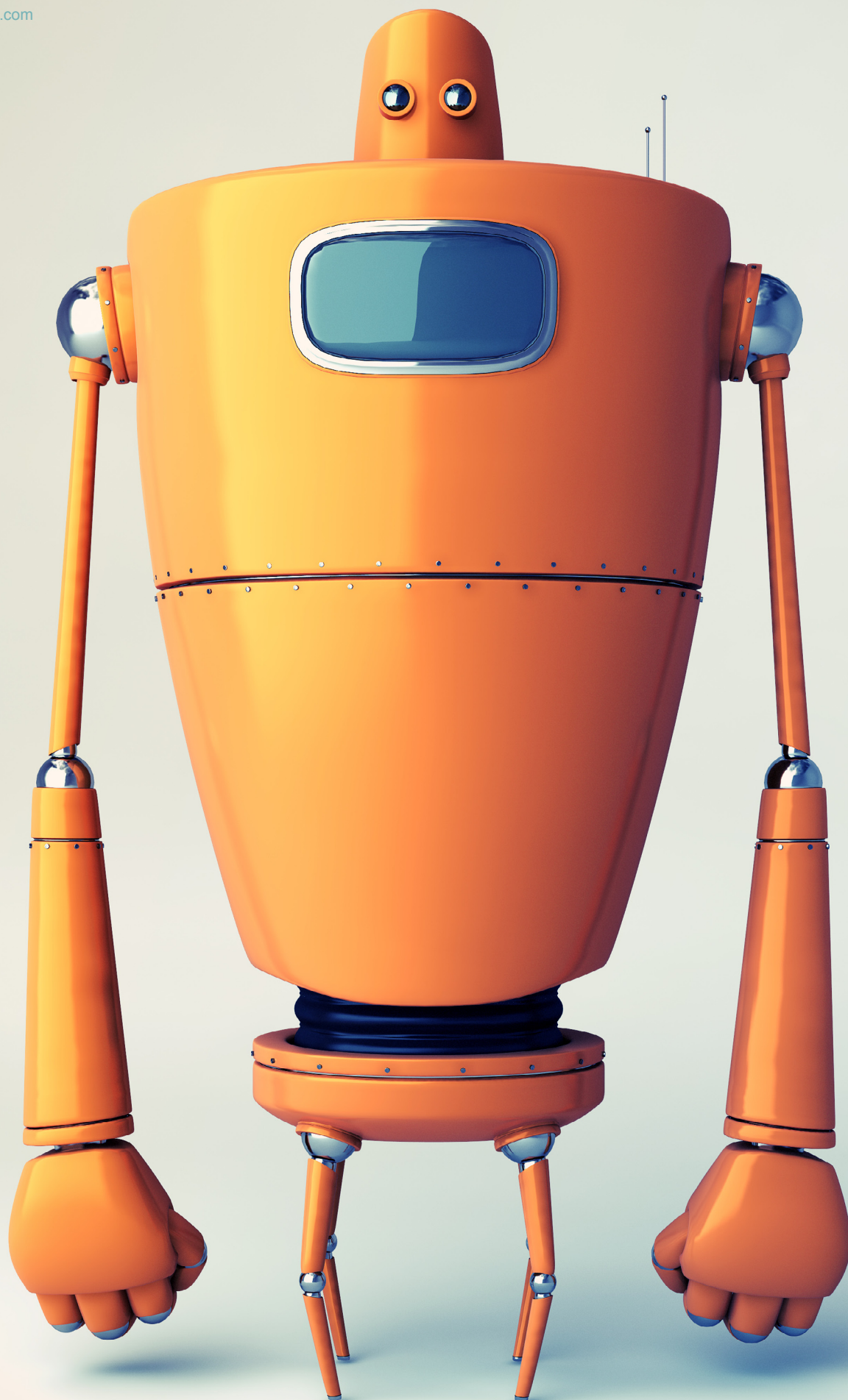
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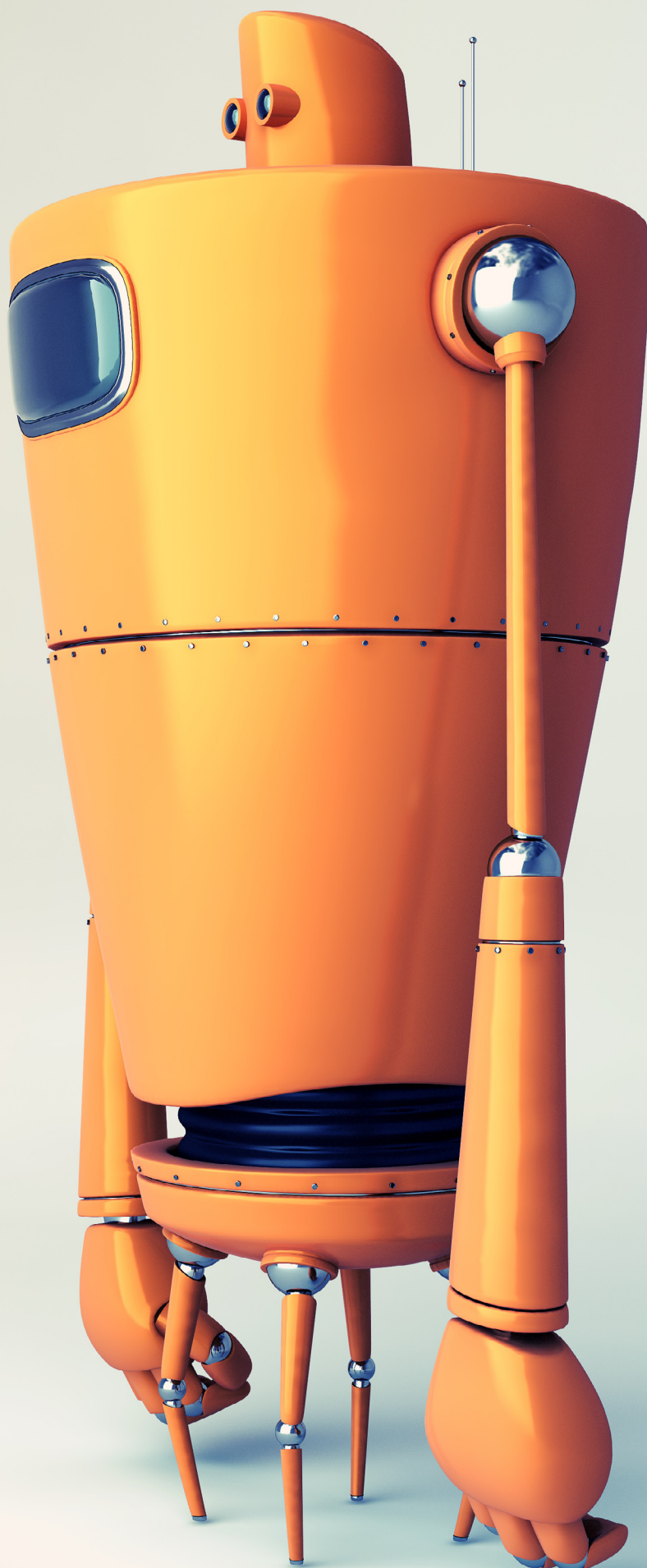
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SWORDMASTER 2

FOLLOW THIS
TUTORIAL SERIES ON
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CHAPTER 6 - RENDERING

In 2006 3DTotal created some groundbreaking training that quickly made a name for itself as one of the best 3D training resources available; that series was called the Swordmaster! Well five years later the Swordmaster is back and better than ever. In this series industry professional Gavin Goulden will be talking you through how to take a concept and turn it into a top quality character ready for use in a game. From basic modeling through to sculpting and texturing, Gavin will cover every step in great detail so that even an inexperienced 3D artist will be able to comfortably follow this series.

COMING UP IN THIS ISSUE...

This month Gavin Goulden will be sharing with us the rendering process.

So if you're interested in seeing the final chapter of this great series, please flip to the back of this magazine and enjoy.

3DS MAX - PAGE 082

MAYA - PAGE 100



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CYBORGS

MIXING 3D & PHOTOGRAPHY



Mixing 3D and photography is a real skill and you've probably seen it attempted with varying results. In this series Andrzej Sykut will be showing us how to achieve the perfect blend of 3D and photography with the coolest of subject: cyborgs. When approaching this task there is a lot to consider. Firstly you must think about the photograph and the lighting you want in your image, then you have to think about how you will create the 3D in the image, and once you have this you will need to create the same lighting on the 3D aspect as in the photograph... the list goes on and on. Tackling this without direction would be difficult, but with the help of these tutorials you can come up with some stunning results.

DECEMBER ISSUE 076 Chapter 01 | Human Hand | JANUARY ISSUE 077 Chapter 02 | Sunglasses
FEBRUARY ISSUE 078 Chapter 03 | Power Plugs | THIS ISSUE Chapter 04 | Spy Snail

CHAPTER 04 - SPY SNAIL

Software used: 3ds Max

While this project was nice and straightforward (and lots of fun), working on a small scale presents certain challenges that I'll try to describe in some detail.

CONCEPT

As futuristic and strange as it sounds, remote controlled bugs with cameras on them are a reality. You may remember a spying cockroach in *The Fifth Element* (and its sad demise). Well it's not restricted to sci-fi anymore! They are actually used in military research. The internet provided plenty of photographs and general information about this and how it is done, so finding references was easy. I decided I wanted to keep it crude and give it a rough, prototype look. I also thought I would add a little humor to it, hence the snail. Let's face it; a snail is useless as far as the military is concerned.

SHOOTING

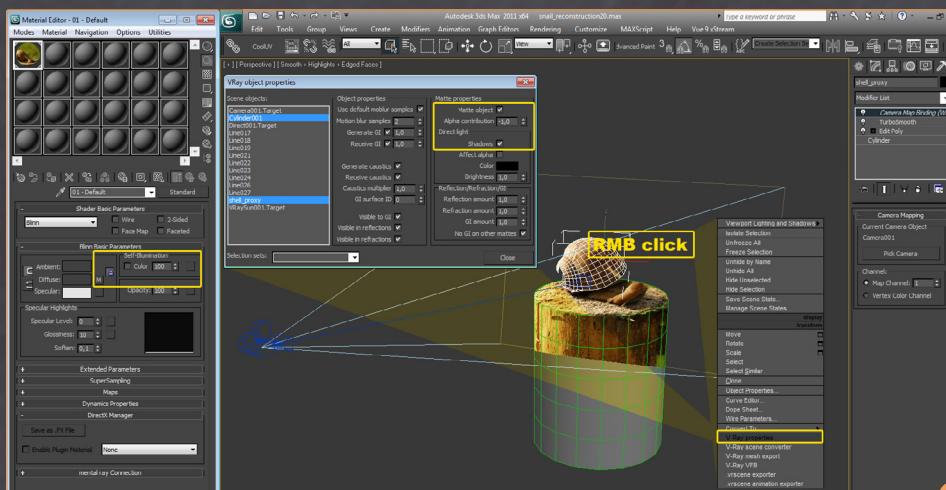
Photographing small animals like insects is hard! It can require special equipment (macro lenses, infrared flash triggers etc.) especially if you are after in-flight images. More sedate images are easier to obtain, although the bugs seem to have a sixth sense and fly away a millisecond before you press the button. Even the snail I used for this project wouldn't sit still and snails are not known for their speed! This ruled out using things like Autodesk's Photo Scene Editor, which proved very useful in previous projects. What is left is just shooting the best photo with the resources available and doing the rest the old-school, hard way! My resources for this photo consisted of an old Nikon D70, a cheap zoom lens and some nice golden sunshine (and the snail) (**Fig.01**).

SCENE RECONSTRUCTION

Due to the mostly organic nature of the subject, camera matching had to be done by eye and there was little to help! There were no three-way



01



02

corners, no square shapes and no converging lines. All I had to work with was the focal length from the image data stored by the camera (70 mm, which should probably have been multiplied by something due to the sensor being smaller than the full frame, but I thought of it only while writing the article), and the wooden fence post on which the snail was sitting. The post is more or less cylindrical, so I could

roughly match the cylinder in 3D. All this doesn't really matter though. Because there are no 90 degree corners in the image, the match doesn't have to be perfect. I modeled the rough shape of the shell, camera mapped everything with the plate photo and assigned some V-Ray Object Properties (Matte object, Alpha contribution: -1, Direct light > Shadows) and that's it as far as scene reconstruction is concerned (**Fig.02**).

LIGHT MATCHING

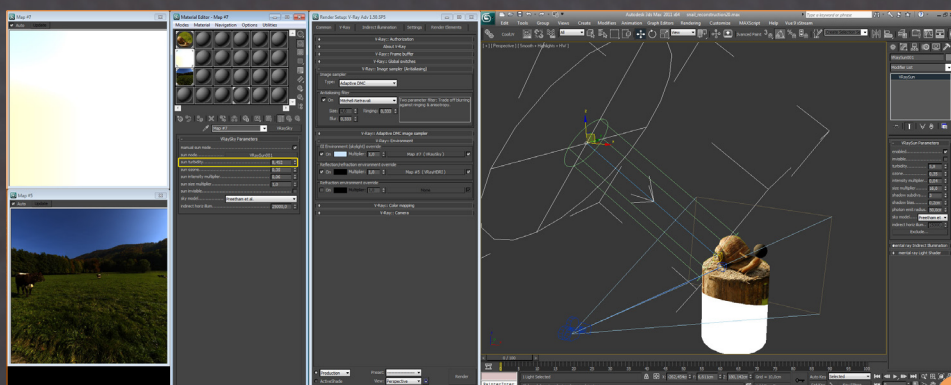
The lighting in the photo is pretty nice; a beautiful sunset, which was quite easy to match. I used a V-Ray Sun and V-Ray Sky as the GI Environment Override. I had to crank up the Turbidity to match the warm colors of the photo. For the reflected environment I used a map from openfootage.net depicting a sunset, as it matched the image well (**Fig.03**). I used GI with almost default settings (with the Irradiance map quality set to very low, a good setting for highres stills). This allows for nice ambient/sky lighting.

MODELING

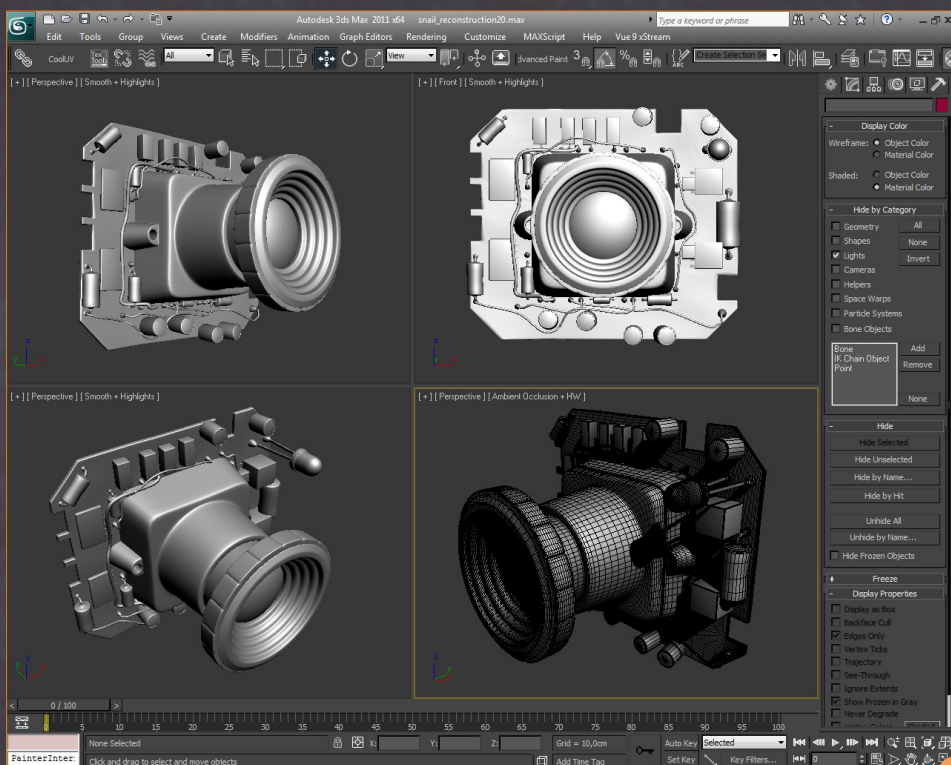
This part was easy as the shapes I needed were quite simple (**Fig.04**). I used Wings 3D for some parts, and 3ds Max for the rest.

TEXTURES, SHADERS AND SMALL DETAILS

When working at a small scale, just matching lighting and shaders is not enough. At this scale you notice the small details that disappear when looking at something from a distance. You can see things like little variations in the material's surface, specks of dirt and other detritus, little bumps, manufacturing flaws etc. At this point it comes down to observation; what's the level of small details on the base plate? In this case the snail's shell was covered with specks of mud or dirt. The mud was a bit thick in places, breaking the silhouette of the shell, so to replicate that the texturing alone wouldn't do. At the same time, the dirt was dull, not shiny and it broke the specularity of the surfaces adding a lot of



03

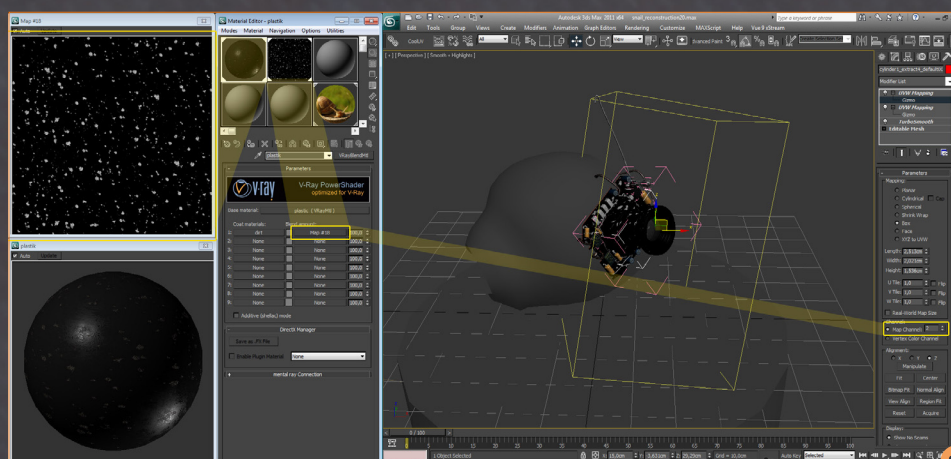


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variation. I approached the problem in two ways. The first approach was on the texturing side. Almost every material in the scene is a V-Ray Blend material, with one of the two layers of dirt added on top of a base material. One of the

layers uses V-Ray Dirt as a mask (essentially an Ambient Occlusion shader) to simulate dust build-up in the corners and other tight spots. This looks pretty good, especially on the dark plastic parts (on some objects like the lens housing this is implemented in the Diffuse slot, which works in almost the same way).

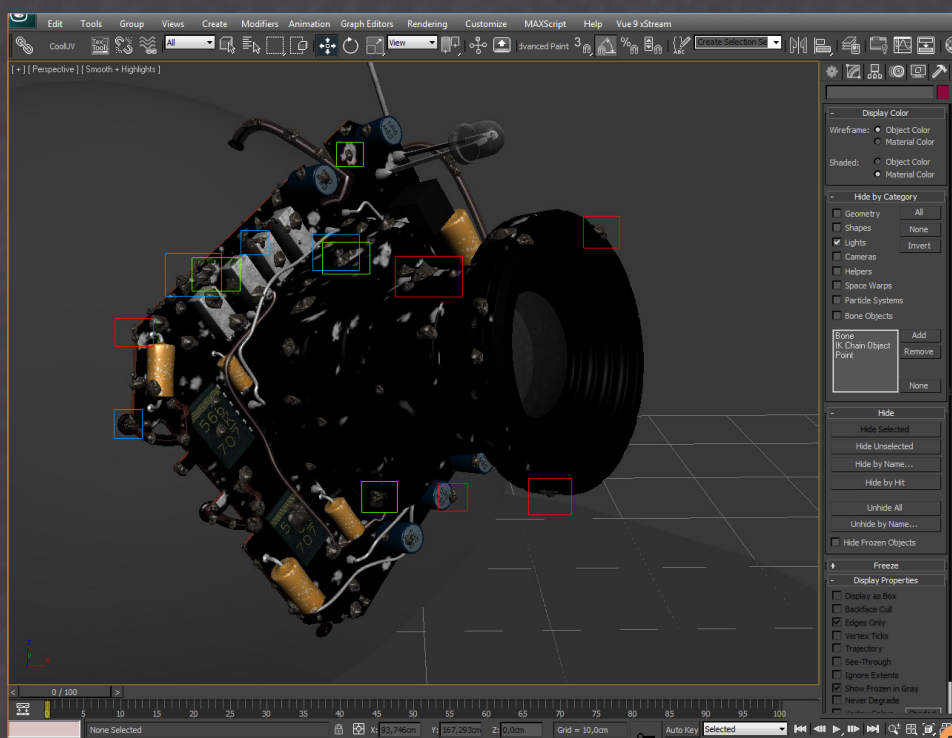
The second layer uses a texture made up of mud specks mapped in the second UV channel, so the objects can have their usual UVs for normal texturing and another set of UVs for the dirt. I used box mapping scaled and moved and rotated until the dirt was in the right place. It's much faster using a generic map and freely transformed UVs than properly unwrapping and painting every speck of dirt in place (**Fig.05**).



05

The second part of the solution was using geometry, tiny objects to simulate the dirt particles. I modeled a few variations of the mud specks in ZBrush (very quickly), optimized them with the Decimation Master and imported them into Max. Then, using one of my favorite scripts (Advanced Painter), I started placing the specks over my model. It took some trial and error because it's easy to overdo it, but I think I got it right in the end (**Fig.06**). The trick is to put a few of the specks in places that mean they break the silhouette slightly (marked red in the image). Another trick is to use the dirt specks from the texture as a guideline for placing the dirt objects (as they use the same material as dirt layers, they blend well – marked in green). Yet another trick is building the specks from a lot of smaller ones, with varied scale and rotation (marked blue). It's not an exact science; you do it by eye like almost everything else on this project.

Even underneath all the dirt the base shaders cannot be left clean and shiny. Surprisingly, I



found that I could often leave the Diffuse and Bump channels alone. The ones that made the difference were Reflection Glossiness and, to a lesser extent, Reflection Color. Both were

mapped with various grunge and metal textures, and edited using the output curves to get the right contrast. This resulted in nice, broken-up highlights and that's what matters here. **Fig.07** shows the progression of the added details in close-up.



RENDERING AND COMPOSITING

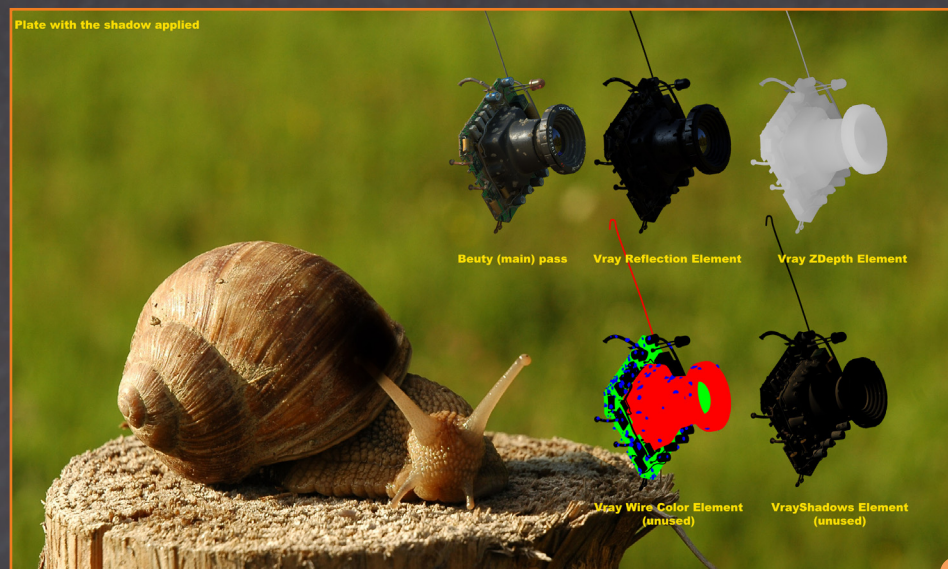
I usually render the shadows cast on the plate separately and apply them in post-production.

This time I just rendered the plate with the shadows applied using the V-Ray matte object (it looked good enough that way because the shadow was applied in the shade area, not in direct sunlight). This was a happy coincidence because adding shadows over the highlights can be tricky to say the least.

My rendered layers consisted of:

- Plate with shadows
- The beauty pass of the circuit board
- Reflection, ZDepth, and some other V-Ray elements

This way I could match the DOF blur and overall softness of the circuit board without affecting the plate, which is quite important, especially



on such a small scale (**Fig.08**). I also did some color matching, added some highlight glow (using the VrayReflection Element), some cropping, vignetting and added some light spots, which was pretty simple. The 3D was pretty well matched, even straight out of the renderer. The biggest challenge was masking out the snail's eye stalk; otherwise compositing was a simple job. I used After Effects as it's very handy if you re-render the image. You just reload the sources and the composition updates. Unfortunately, you can't do that in Photoshop easily (**Fig.09**).

ANDRZEJ SYKUT

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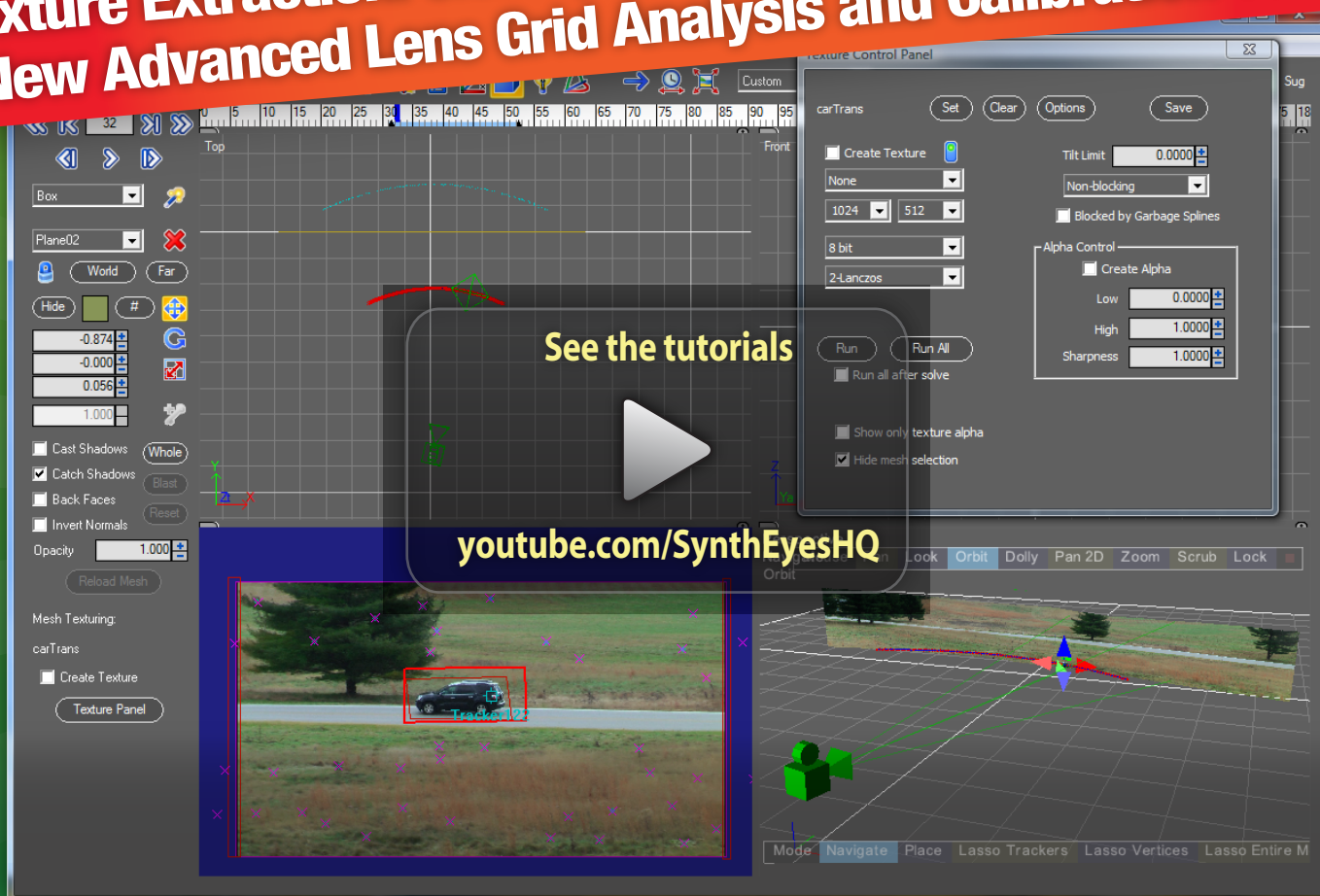




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ARMORED BEASTS

ZBrush is a formidable piece of software that is capable of so much. The possibilities are endless and the only restriction is your imagination. In this series our artists will be flexing their creative muscles to show us how to create not only the organic forms of their beasts, but also the non-organic forms that make up their armor and weaponry. Follow the creation process from initial concept through to final illustration and find out how to create some mind-blowing armored beasts!

JANUARY ISSUE 077 Chapter 01 | Lizard FEBRUARY ISSUE 078 Chapter 02 | Bear THIS ISSUE Chapter 03 | Chicken
NEXT ISSUE Chapter 04 | Gorilla MAY ISSUE 081 Chapter 05 | Cat JUNE ISSUE 082 Chapter 06 | Rhino

CHAPTER 03 - CHICKEN

Software used: ZBrush

INTRODUCTION

As part of this series dedicated to the creation of armored animals in ZBrush, I have been given the task of creating an armored chicken! I have always been a fan of humor, so I am sure I will have great fun developing this.

In this tutorial, we will be using ZBrush 4 for the whole project with the exception of compositing, which will be handled in Photoshop. ZBrush 4 brought us the tools that were missing in previous versions to handle non-organic models and angular shapes. Even though ZBrush works very differently from other 3D packages, which provide greater precision and a lot more tools to edit polygons, the capability of exploring a concept is ZBrush's greatest advantage. Make sure that you have installed the Subtool Master and Transpose Master plugins, which are free to download from Pixologic's website.

As ZBrush will be used for the materials and render, the good news is that we won't need to set UVs and we will have zillions of polygons to work with! Prepare your hard drive for some big files!

THE CHICKEN

My first step was to sketch my subject – the chicken. We all think that we know how a chicken looks until we try to draw one. Suddenly questions start to rise, like how many fingers does a chicken have? What is the shape of the beak? What is the position of the eyes in relation to the head? All of these are easily answered with an internet search for chicken images. Drawing is a great exercise because early on you are forced to answer all your doubts about chicken anatomy (**Fig.01a – b**).

ARMOR FOR THE CHICKEN

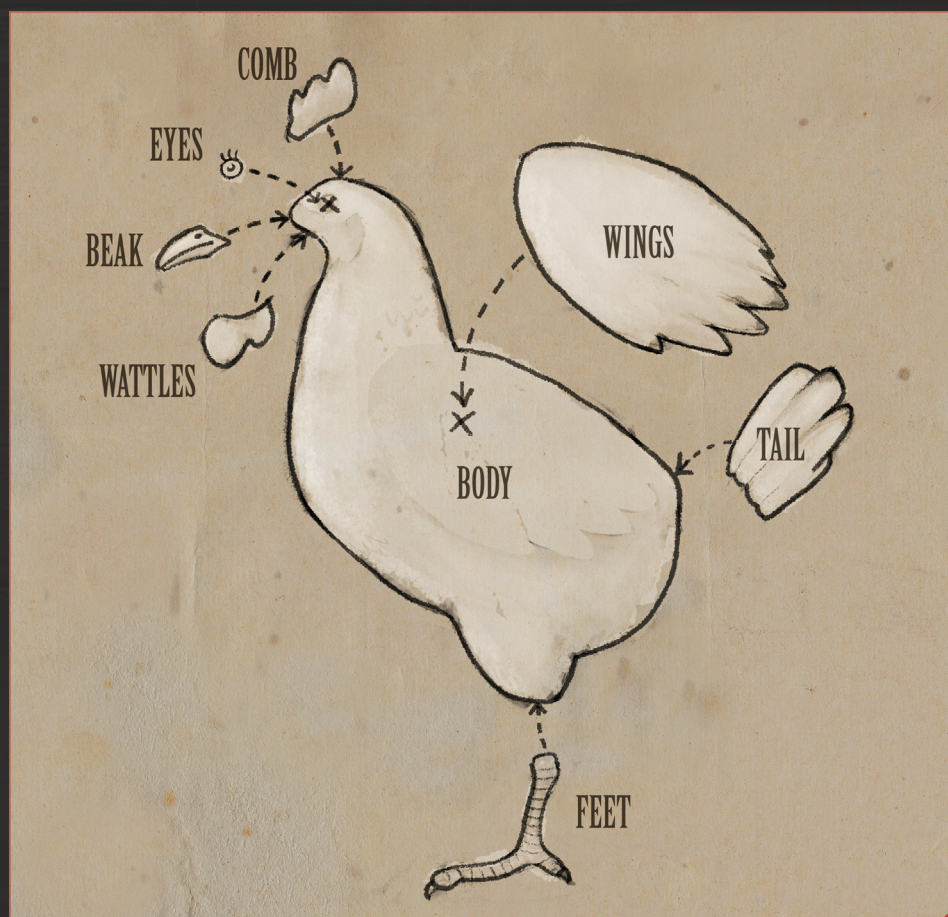
What armor is most appropriate for a chicken? I thought that Roman armor would suit her perfectly. The idea came from the chicken's



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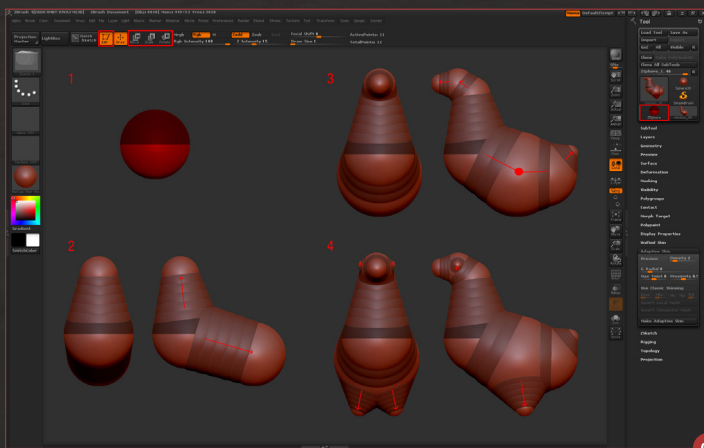
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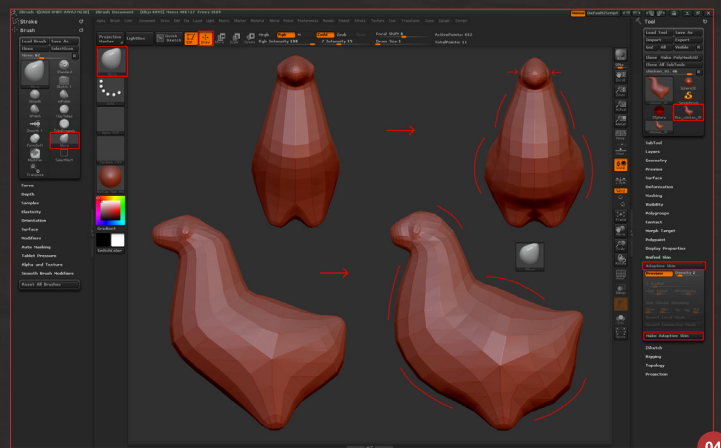
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comb, which works really well as part of a Roman helmet, replacing the traditional feathers on top. To test the concept I sketched the armor on top of my first chicken sketch.

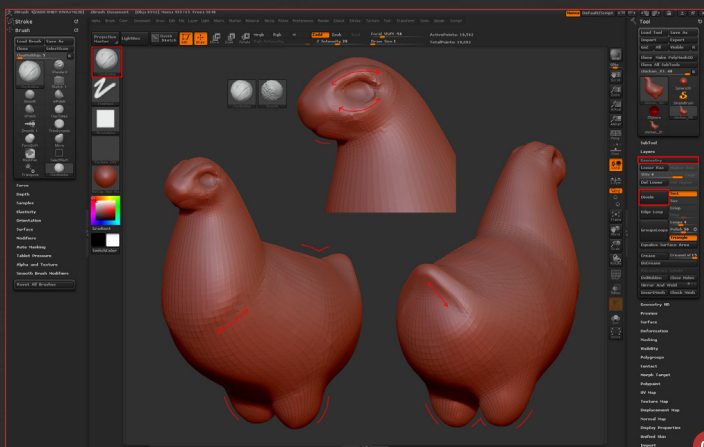
Even though I plan to make a more cartoony chicken than the one in the sketch, I will leave the decisions on the proportions for later as ZBrush allows me to study and modify the form with ease. The strategy I used to design some of the armor pieces was to create a very simple chicken shape and build the armor on top of it. Also as we will be using ZBrush to apply different materials I prefer to separate some of the chicken's parts. If you look at **Fig.02** you can see my chicken butchering strategy!



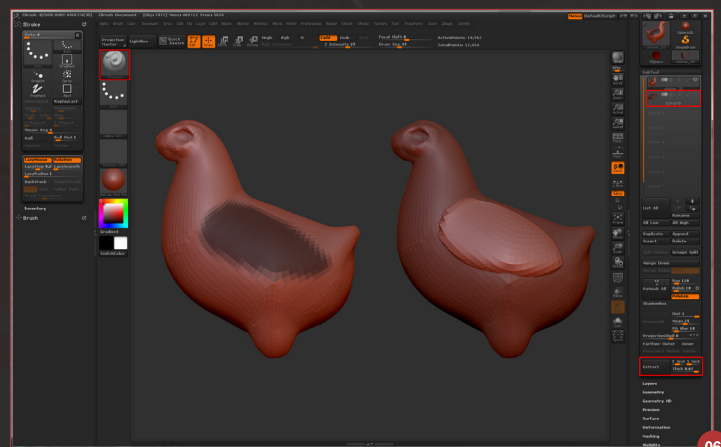
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BASIC FORM

Start ZBrush, choose ZSphere from the Tool palette and drag it onto the center of screen to create it (press Shift while dragging to keep the ZSphere horizontal). Press Edit (or T on keyboard) to enter Edit mode. Activate Symmetry by pressing X.

While in Draw mode, drag on a ZSphere surface and a new, connected ZSphere will be created. If you drag at the symmetry line, a single ZSphere will be created; if you drag on any other point of the ZSphere then two new, symmetrical ZSpheres will be created. Use the Move and Scale modes to position the ZSpheres. If you click the chain between two ZSpheres while in Draw mode, a new ZSphere is created at that point.

To create the form of the body, assume that the first ZSphere is the chest and create a new one to define the neck, and another to set the length of the body. Create a new, larger ZSphere

between the chest and the rear to create the belly. Also, create two ZSpheres originating at the tip of the neck to define the head form, and a smaller ZSphere at the rear where the tail will be placed. To finalize the base, create a ZSphere for the eyes and another originating at the belly to create the thighs (**Fig.03**).

In the Tool menu, under Adaptive Skin, press Make Adaptive Skin. A new tool will be created with the prefix Skin_. Choose the Skin_ tool and continue working on this tool as we won't be needing the ZSpheres anymore.

Turn on Symmetry (X). Select the Move brush from the Brush menu and make the chicken's body rounder. Push the eyes inward so that they lie on the same plane as the head (**Fig.04**).

In the Tool menu, under Geometry, press the Divide button twice to subdivide the model two levels. Use the Clay Buildup brush to mark the eyebrows and cheeks on the head. Pressing Alt

while using the Clay Buildup brush carves the orbits of the eyes. Press Shift while using the brush to smooth the area after adding volume. With the same brush, make the thighs rounder and distinct from the main body. Also mark the back of the chicken and the base of the neck (**Fig.05**).

WINGS

Select a Standard brush. While pressing Ctrl, paint a mask on the body marking a very simple wing shape. In the Tool menu, under Subtool near the Extract button, set the E Smt (Edge Smoothness) value to 41 and the Thick value to 0.67. Press the Extract button. A new subtool will be created with the rough form of the wings (**Fig.06**).

Select the wings subtool. Deselect the mask on the wings by pressing Ctrl and dragging on the background. Select the Move Elastic brush and reshape the wings. Also, make sure to move the tips of the wings away from the body.

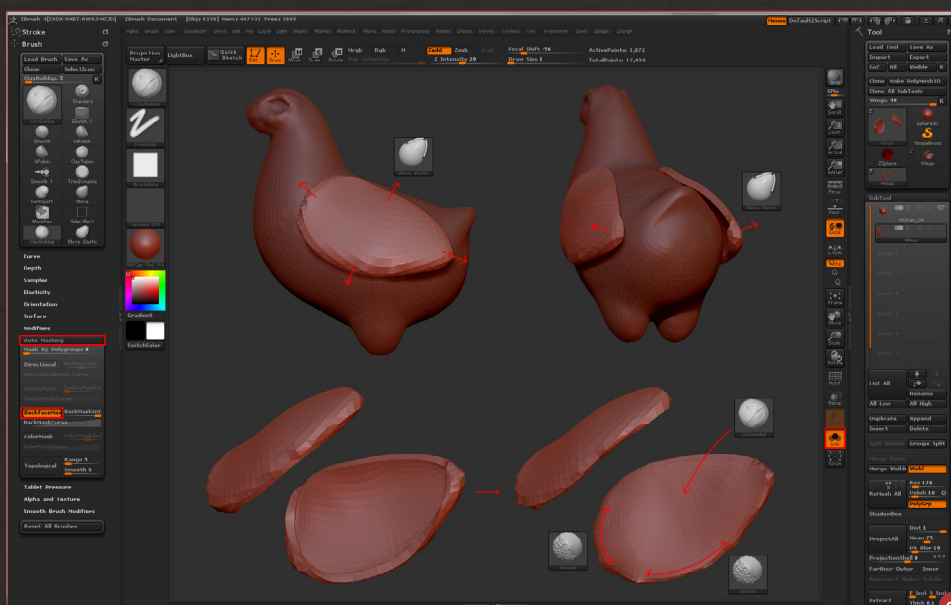
Choose the Clay Buildup brush. In the Auto Masking submenu in the Brush menu, enable BackfaceMask in order for your strokes not to influence the other side of the surface on thin surfaces. Isolate the wings layer by pressing the Solo button. Smooth the edges on the inside of the wings by pressing Shift while sculpting, and fill the inside of the wings to make them thicker (Fig.07).

Subdivide the wings subtool once. Work on the exterior of the wings using the Smooth brush extensively along the edges to make them rounder. Alternate the Clay Buildup and Smooth brushes to add volume to the wings, especially at the shoulder area. Make sure that you end up with a nice soft surface (a simplified version of a wing) (Fig.08).

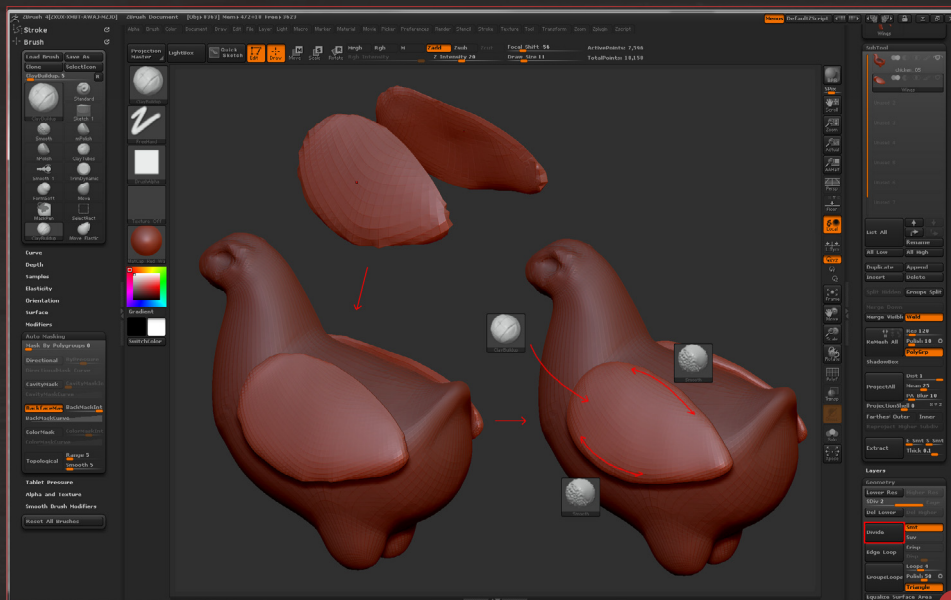
BEAK

To create the base of the beak, click on Append in the Subtool submenu and choose the ZSphere. Select the ZSphere subtool and activate the Transp button so that you can see the ZSphere inside the chicken's body. Activate Symmetry (X). Move and scale the ZSphere to place it at the mouth area of the head. Extend one ZSphere to the inside of the head and another to the outside, scaling it down to form the tip of the beak. Add two ZSpheres along the beak and move them to set the curve of the beak. In the Adaptive Skin submenu, press Make Adaptive Skin. A new tool named Skin_ZSphere1 will be created. In the Subtool submenu click on Append and choose the Skin_ZSphere1 tool. Now you have the beak model as a subtool of the chicken tool. You can delete the ZSphere subtool (Fig.09).

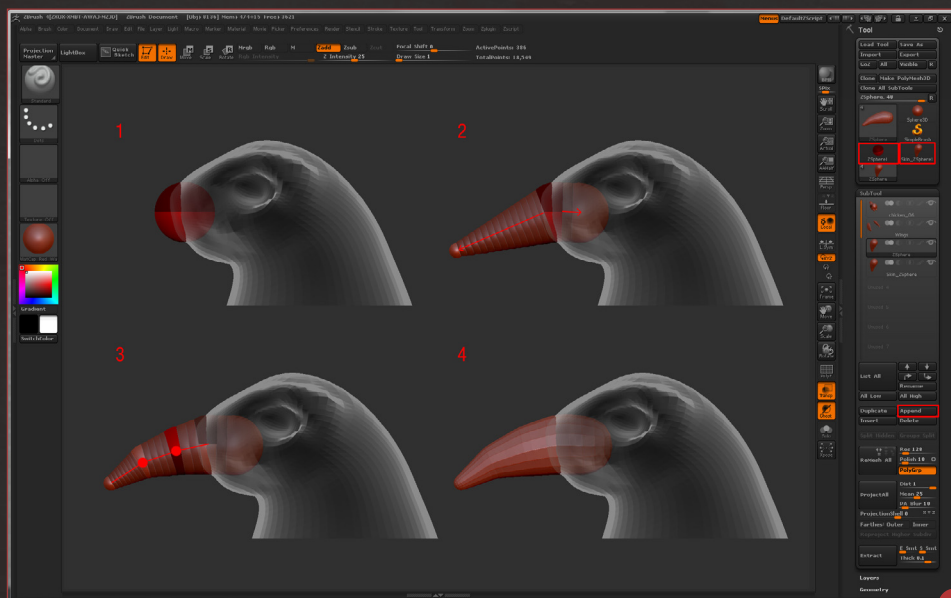
Activate Symmetry (X). Select the Move brush, change the form of the beak so that it adapts to the head and subdivide it twice. Choose the Dam Standard brush (you can find it by opening Lightbox and choosing the Brush folder) and create a cut that separates the upper and lower parts of the beak. Using the Clay Buildup brush, carve the nostrils.



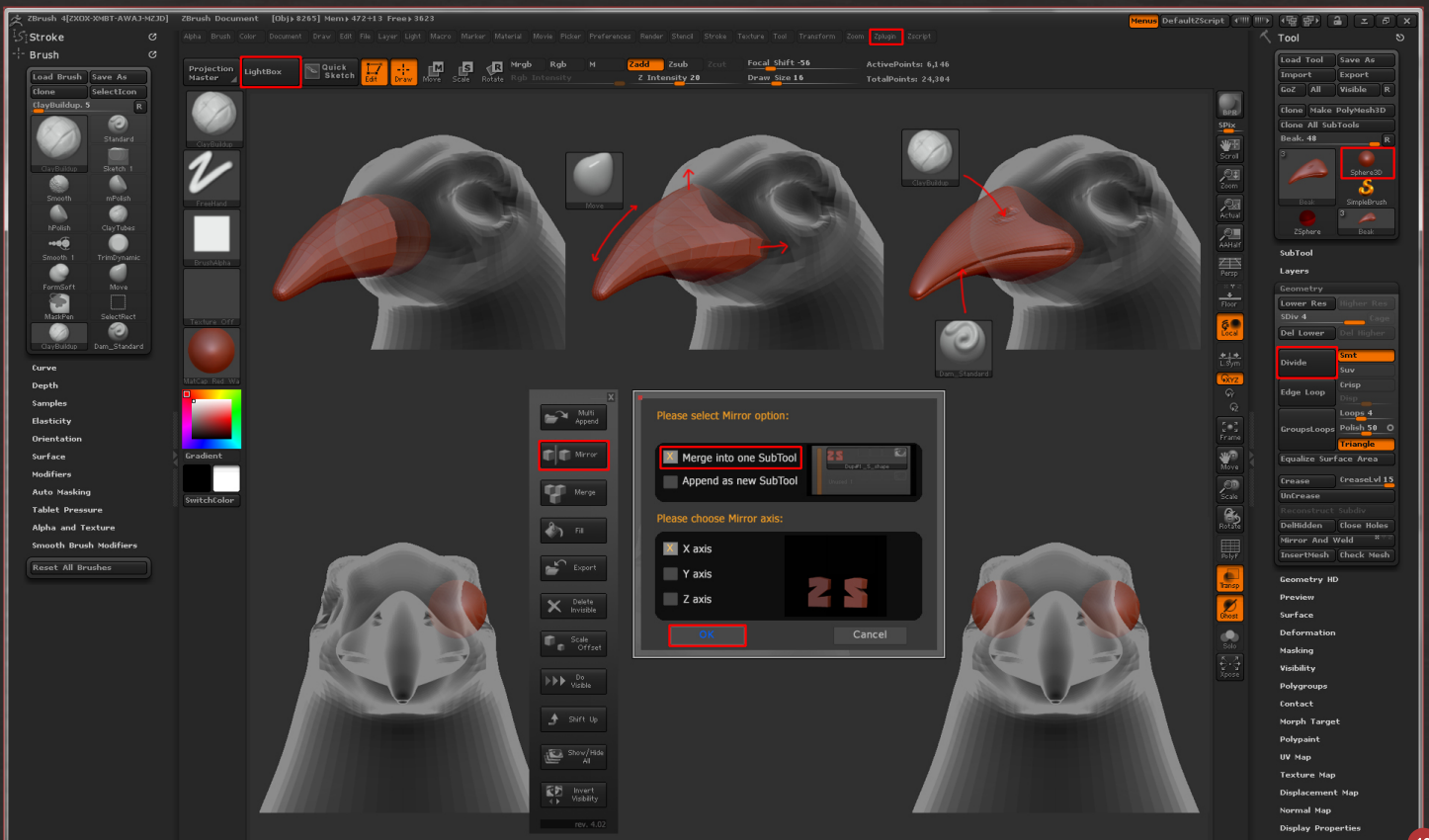
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To create the spheres for the eyes, click on Append and choose the PM3D_Sphere3D tool. The sphere will be added to your subtools. Move and scale the sphere to position it on the right eye orbit. In the ZPlugin menu choose Subtool Master (free plugin downloadable from Pixologic's website). Pick Mirror. Activate the Merge into one Subtool option and press OK. Now you will have two mirrored spheres placed on the eye orbits. Activate Symmetry (X) on this subtool (Fig.10).

COMB

The comb will be created with Shadowbox. This technique requires you to already have a subtool in order to initialize it, so we will duplicate the eyes subtool and start from there.

Choose the eyes subtool and click on Duplicate. A new subtool with a copy of the eyes will be created. Click on the Shadowbox button in the Subtool submenu. A cube with three walls is created with a mask painted on each wall, which corresponds to the projection of our subtool object. Press the Trans button to keep the object transparent and have a clear view of the cube's walls. Also make sure that the Ghost option for transparency is enabled.

Choose the Standard brush. Press Ctrl and drag on the background to clear the masks on the cube. On a side view, while pressing Ctrl, mask the form of the comb on the side wall of the cube, keeping the chicken model visible as a guide. Change to the front view and mask the

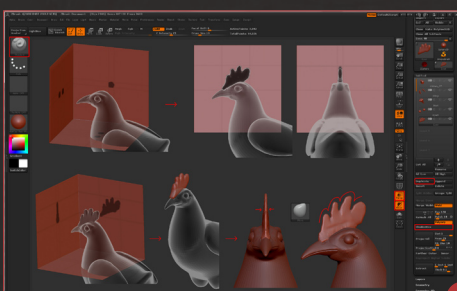
projection on the front wall with a front view of the comb. You will notice that a volume resulting from the two projections has formed. Click on Shadowbox and the volume will be converted to geometry that you can sculpt. Using the Move brush, adjust the form and thickness of the comb (Fig.11).

WATTLES

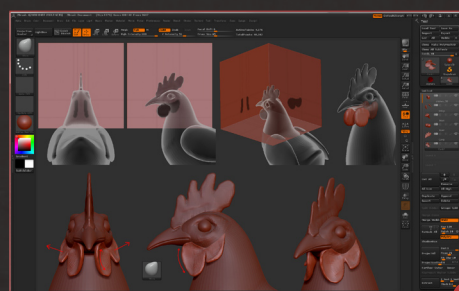
We will be using Shadowbox again for this part. Duplicate the comb subtool, press Shadowbox and clear the cube's wall masks. Paint the wattles mask on the side and front views. The back part of the wattles (which are actually the chicken's earlobes) will be inside the head volume. Press Shadowbox to create the mesh. With the Move tool, move the earlobes out of the head volume. Using the Move and Smooth brushes, make the wattles thinner and concave (Fig.12).

LEGS

ZSpheres are great for modeling bony legs. Press Append and choose ZSphere. Scale and position it at the lowest point of the thighs.

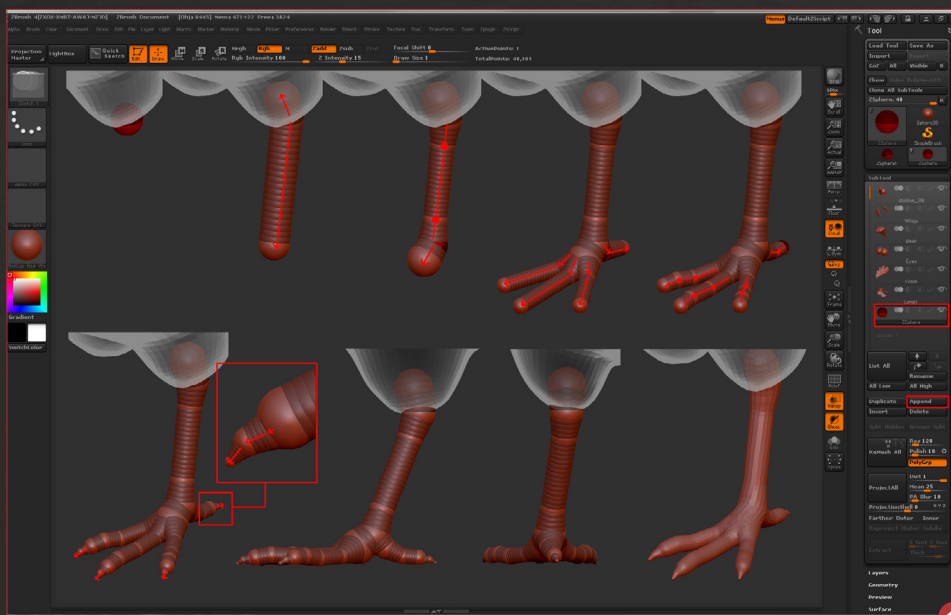


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Extend one ZSphere up into the thigh and extend another one down to create the bone of the leg. Add two ZSpheres along the bone to make it thinner at the central part and thicker at the ends. Extend one ZSphere and scale it up a bit to make the palm. Grow three fingers from the palm and another from the heel. Add ZSpheres along the fingers to create their curvature. Finally, create some smaller ZSpheres at the tip of each finger to create the nails. Go to Adaptive Skin and press Make Adaptive Skin. A new tool with the prefix Skin_ will be created. Append it to your tool and delete the ZSpheres subtool. Using the Subtool master from the ZPlugins, mirror the leg into the same subtool and activate Symmetry (X) (**Fig.13**).



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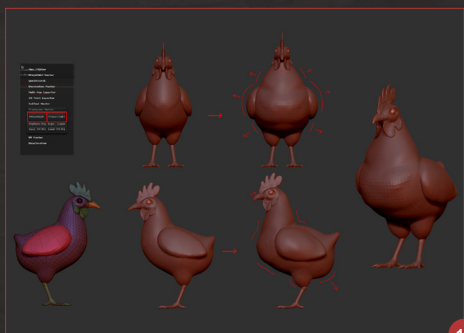
PROPORTIONS

As we have created each part of the chicken separately it might be necessary to make some adjustments because this is the first time we see all the elements together. Also I want to give the chicken some more exaggerated proportions. In order to work on the proportions of all elements at the same time we will be using the Transpose Master plugin (free plugin downloadable from Pixologic's website).

When using the Transpose Master, ZBrush will temporarily merge all the subtools at their lowest

subdivision level so that we can edit them together and then apply those changes to each of the subtools individually. In order to have more detail to work with on the body, select the body subtool, go to subdivision level three and press Del Lower. Now we have a lot more detail at the first level, which is the one to be exported to the Transpose Master.

From the ZPlugin menu, choose Transpose Master. Press TposeMesh. Using the Move brush, rework the proportions. Each subtool is identified with a different polygroup so you can easily hide/mask parts of the model. I have enlarged the breast area and marked more clearly some of the changes of direction in the silhouette. I've also made the neck a bit longer and reduced the length of the beak. When you are satisfied with the overall proportions, press Tpose > SubT from the Transpose Master menu. All the changes will then be transferred to the original model (**Fig.14**).



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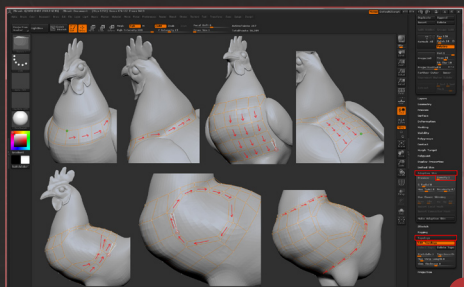
CHEST ARMOR

With the chicken's base complete we will use it as a mold for the chest armor. We will use the Topology tool to create new geometry that sticks to the surface.

Append a new ZSphere tool. Under the Adaptive Skin submenu, lower the Density

value to 1, so that we can preview the geometry accurately without any smoothing. In the Topology submenu enable Edit Topology and activate Symmetry (X). Now when you click on the chicken's surface, a new vertex is created. Each time you create polygons with three or four sides they are closed. By Ctrl + clicking on a vertex you define that you want to create a new edge originating at that vertex. Alt + clicking on a vertex deletes it. If you want to move the vertexes, change from Draw mode to Move mode. However, bear in mind that when you move them they are no longer sticking to the surface! Every time you need to see the geometry press A to toggle between wire and preview.

Start by clicking at the center of the chest where the neck ends (a small green circle should show up indicating that you are at the symmetry line) and create a loop of quads that passes over the shoulder and meets at the back. Create new quads at the front covering the chest and ending at the waist line. Create quads at the back covering the back up to the waist line. Hide the wings and create quads connecting the waist line, leaving a hole for the shoulder to pass through. Create a new tight loop of quads around the shoulder area. Create one tight loop of quads at the neck line and another at the waist line (**Fig.15**).



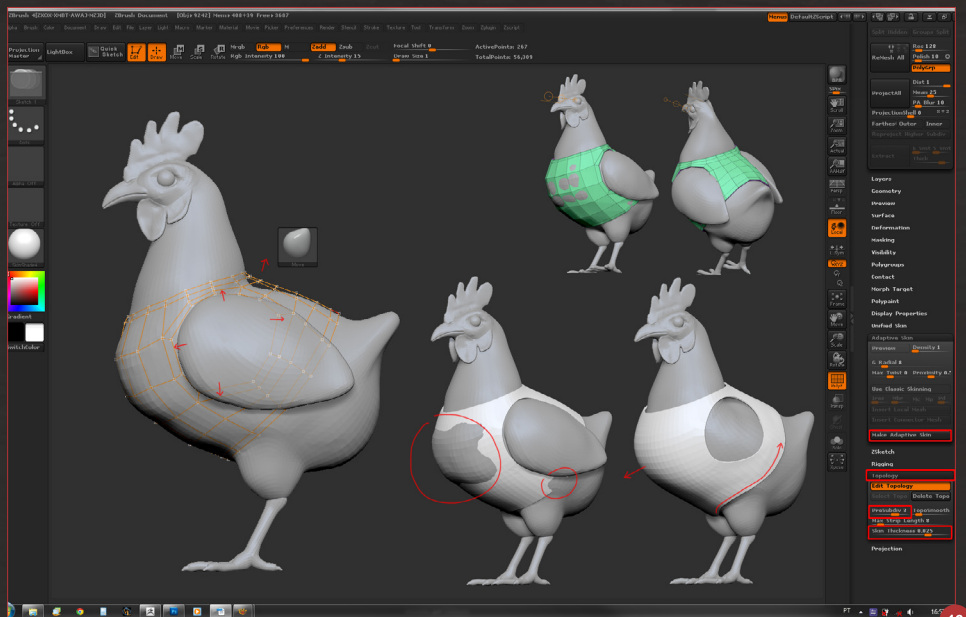
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Under Topology, increase the Skin Thickness value to 0.025. Now, as you press A to see the Adaptive skin you will notice that it has a thickness. Change from Draw mode to Move mode. Some areas (due to the fact that they stick to the surface) will need to be adjusted. For example, the part of the armor behind the neck is concave and it should be convex. Now you can move the vertexes freely. I have repositioned the vertexes around the shoulder to let the wing pass with less intersections and adjusted the back of the armor to be convex.

Under Topology, raise the PreSubdiv value to three to add subdivisions to the mesh result. Press A to check if you like the result. Press Make Adaptive Skin and a new tool with Skin_ prefix is added to the tools. Append it to your chicken tool. You can discard the topology subtool. Use the Move brush to rectify any intersections. I have also adjusted the curve of the waist line, lowering it on the area between the legs (Fig.16).

HELMET

The helmet base will also be made using the Topology tools, following the design of the initial sketch. Repeat the procedure for the chest armor, appending the ZSphere and using the same settings. With Symmetry on, create a quad starting at the beak in the area in front of



the comb. Extend the quads along the comb. Create polygons surrounding the eye area and covering the back of the head. Below the eye, extend the quads to create the lateral face protection. Extend the polygons at the back to create the neck protection.

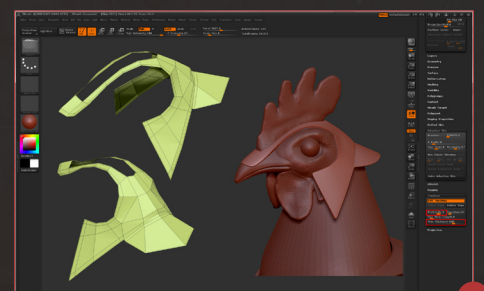
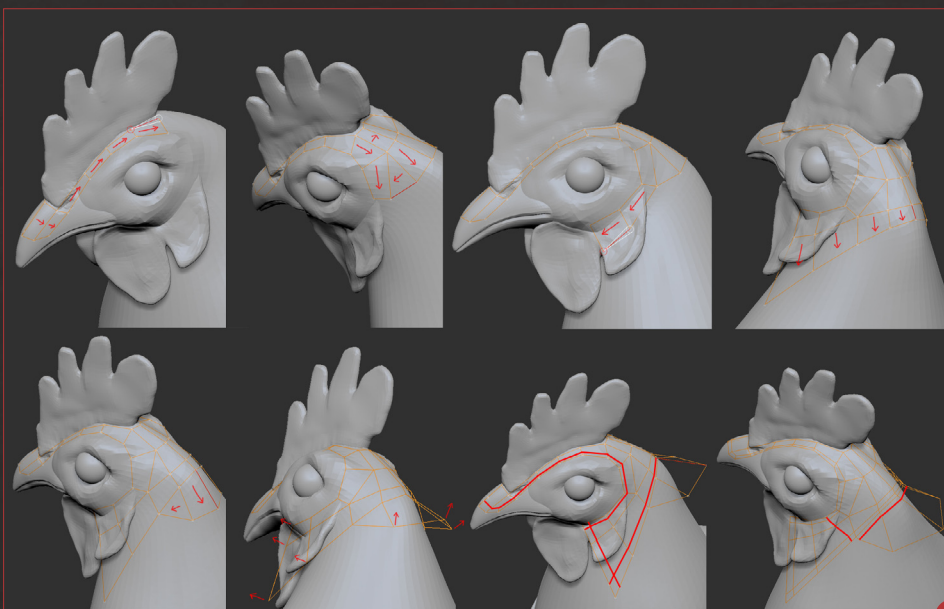
As the polygons are sticking to the surface we need to change to Move mode to lift the neck and lateral face protections. In order to preserve some of the sharp angles of the helmet we need to create some edge loops. In Draw mode, click on the edges to create a new vertex at that point. Create an edge loop starting at the border of the nose protection and surrounding the eye.

Also create an edge at the frontier between the back of the helmet and the neck protection. Check Fig.17 to follow the modeling sequence.

Under Topology, set PreSubdiv to 3 and Skin Thickness to 0.02. Press Make Adaptive Skin. A new tool with Skin_ prefix is added to the Tools. Append it to your chicken tool. You can discard the topology subtool (Fig.18).

SHOULDER PADS

Once again, the Topology method will be used. Append a ZSphere and activate Symmetry. Turn on Edit Topology and create a loop of quads at the limit of the shoulders, where they meet the existing chest armor. Create another loop inside the first one and then fill the area between the loop to close the shoulder pad. At the edge, create some separate quads that will work as feather tips. With a PreSubdiv value of 3 and a Skin Thickness of 0.02, make Adaptive Skin. Append the Skin_ subtool and delete the topology base. With the Move brush adjust the



shape in order for the shoulder pad to overlap the chest armor a bit. Create some space between the pad and the wing. I have also made the tips of the feathers rounder (Fig.19).

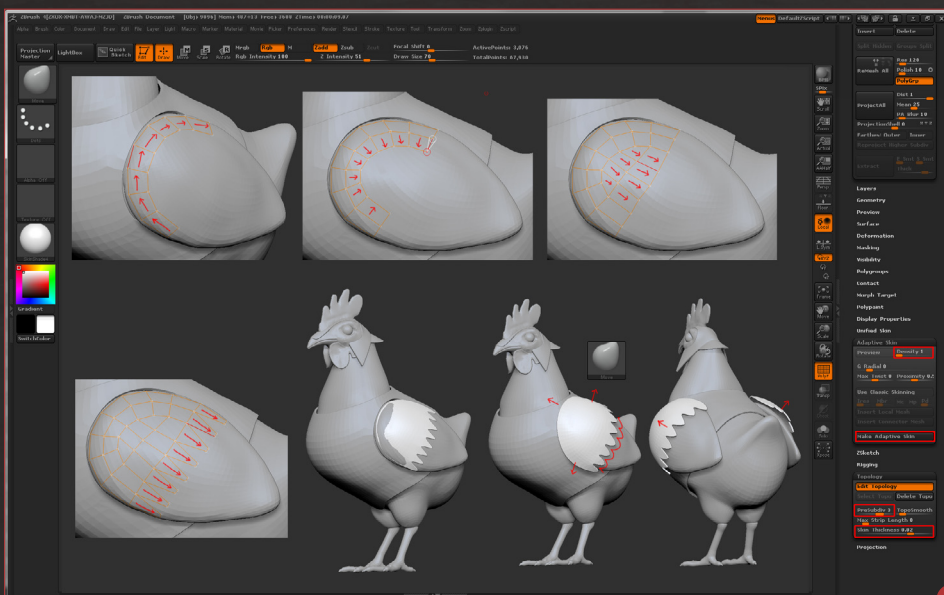
LEG PROTECTION

ZBrush has got some very powerful parametric primitives. We will use them to create the leg protection. From the Tool menu choose the Cylinder3D. Under Initialize you can adjust all the cylinder's parameters. Set the X and Y Size to 30. Set Inner Radius to 76, Hdivide to 10 and Vdivide to 20. We have created a tube divided in squares.

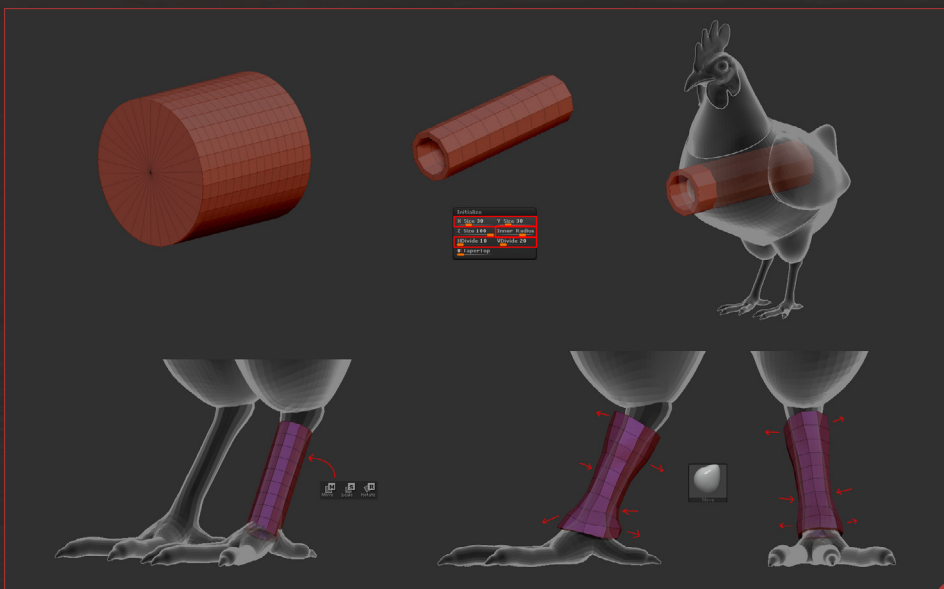
Select the chicken tool and append the cylinder you have created. It will be automatically converted to Polymesh3D. Using the Move tool, rotate and scale this to position it on the tube on the lower leg. In Draw mode, using the Move brush, shape the tube as a shin protector (larger at the top and bottom). Using the Subtool Master plugin, mirror the leg armor to the other leg keeping it in the same subtool. Activate Symmetry (Fig.20).

DETAILING THE ARMOR

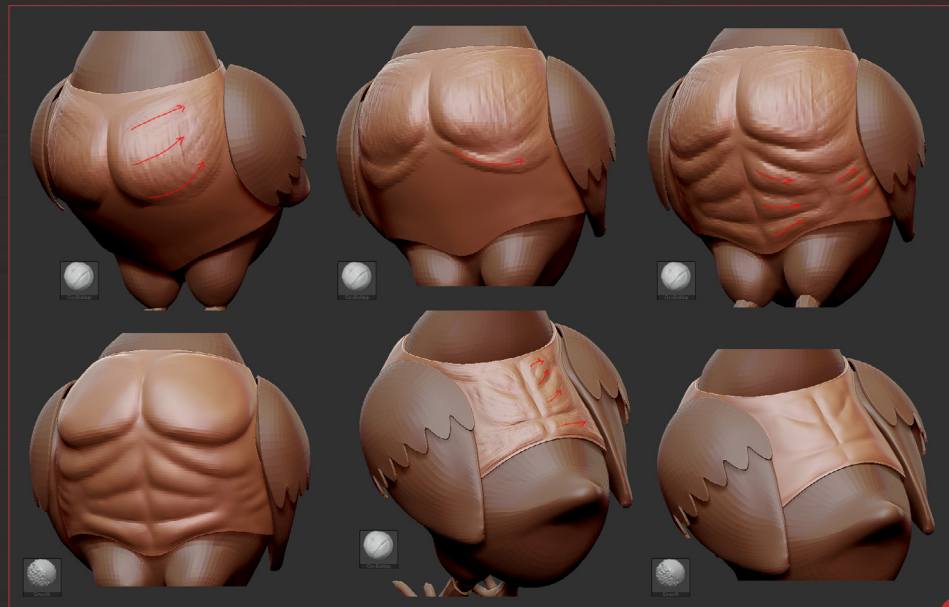
The base is completely set and now we can start detailing each of the armor parts. Choose the chest armor and subdivide it twice. Select the Clay Buildup brush and enable



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BackfaceMask under Auto Masking. Start by marking the pectorals at the center and add volume to make them rounder. Then add the rib cage below, followed by the abs. Then use the Smooth brush to achieve a more polished look. Repeat the procedure on the back, creating some muscle structures, and then smooth the result (Fig.21).

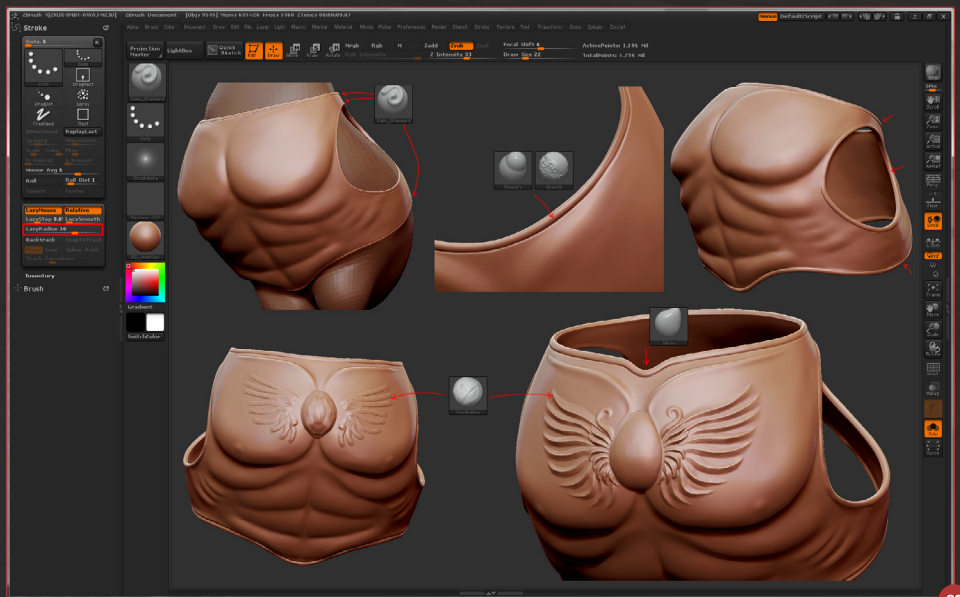
Subdivide the chest armor twice more. Select the Dam Standard brush. In the Stroke menu increase the LazyRadius to 30. Mark a thin line near the edge of every opening. Select the Magnify brush and stroke at the edges of the armor to make them rounder; also, use the Smooth brush to even them out.

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For the decorative elements I created two chicken motifs (egg and wings). With the Clay buildup brush I sketched the egg and wings. Then I added another subdivision level and refined the motifs with the Clay Buildup and Smooth brushes. Above the sternum I created an indent with the Move brush to break the line of the neck (**Fig.22**).

For the detail on the shoulder pads, subdivide the model twice, pick the Clay Buildup brush and roughly mark the layout of the feather structure. Also, using the Smooth brush, try to tighten the detail as much as possible at this resolution. Subdivide twice more. With the mPolish brush polish the edges of the feathers to remove the roughness. Subdivide once more, finalize the edges with the Clay Buildup and use the Smooth Stronger brush to smooth the central area of the feathers. Using the Standard brush with a Brush Modifier value of 54 and LazyStep of 0.05, mark the central division of the feathers (**Fig.23**).

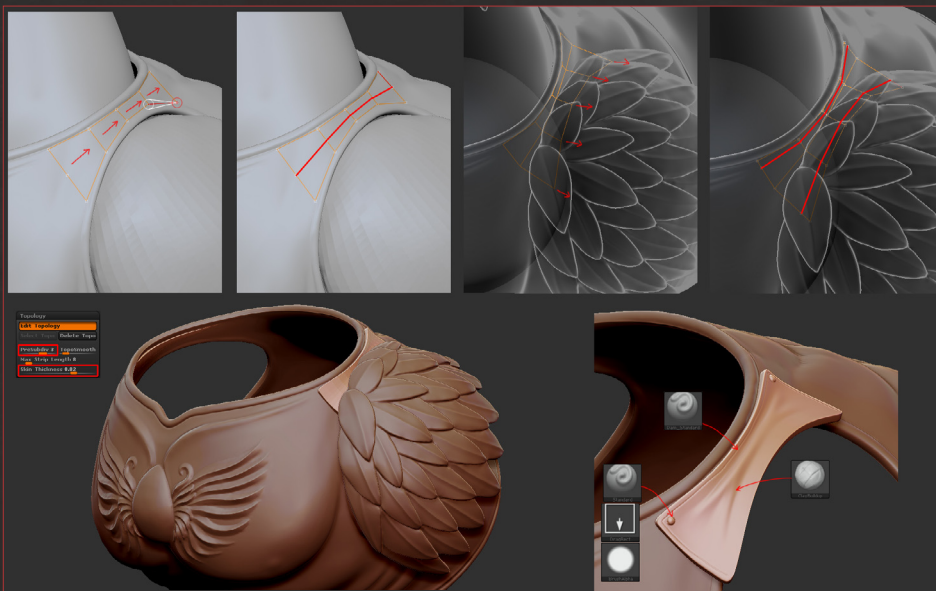
To connect the shoulder pads with the chest armor we will create a leather strap nailed to the chest piece. Using the topology technique described previously, create a strap of quads at the shoulder area of the chest armor. Create a new edge splitting the strap horizontally. In Move mode pull the lower vertexes so that they



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are placed under the shoulder pads. Create an additional edge loop at both ends. Lower the Adaptive Skin Density to 1. Under Topology, set PreSubdiv to 3 and Skin Thickness to 0.02. Make Adaptive Skin and append the Skin_ tool. Delete the topology. Turn on Symmetry. Subdivide the leather strap four times. With the Clay Buildup brush, create some folds. Using the Dam Standard brush, create a line at the edge of the strap. With the Standard brush set to DragRect and Alpha 06, create the nail heads (**Fig.24**).

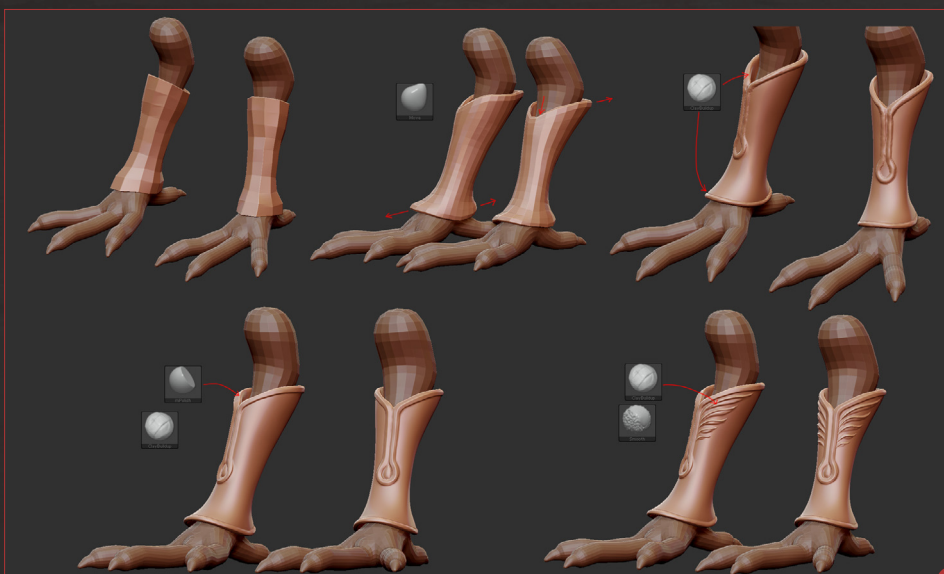
To detail the leg protectors, subdivide once and, with the Move brush, raise the back and lower the front. This seems to be more ergonomic

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for a chicken as this articulation bends in the opposite direction of the human knee. Also extend the lower part back and forward to cover a bit of the chicken's feet. Subdivide twice and create a thicker border with the Clay Buildup brush. I have also decided to extend the border thickness down to create a decorative element on the shin. Subdivide twice more. Use the mPolish brush to accent the edges of the border elements. Working with the Clay Buildup and Smooth brushes, create some feather elements on the shin protectors (Fig.25).

Select the helmet and subdivide it four times. Use the Slash2 brush with Lazy Mouse on to create a plane difference around the eye area. As the Slash2 brush is actually raising one half of the brush and lowering the other half, you will have to use the Smooth brush to remove the marks on each side of the cut. To add some decorative nail heads, select the Standard brush and set the stroke to DragDot. Then choose brush Alpha 06, set the correct brush size and intensity, and place some evenly spaced nail heads. As in the previous armor pieces, I have used the Clay Buildup brush to create some feathers on the cheek protection. The same brush was used to dig a hole for the nostrils (Fig.26).

To add some textural detail to the armor surface I've activated the Noise option under Surface



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on the Tool menu for all metal pieces. I have tweaked the Strength, Noise Scale and Noise curve to achieve a pleasantly worn look on each. In the image you can check the values and noise curve for each piece. It is important to tweak the values with a metal MatCap applied, because the values are very subtle and will look different with other materials. I have used the Zeoyn_Gold MatCap, which I have created and can be downloaded for free at my website (www.artofjose.com under Goodies/ZBrush).

For the straps, which are made of leather, I've used the Standard brush in DragRect mode (loading the Leathery Skin 15 alpha from the ZAlpha folder of the ZBrush installation) to add a bit of leather texture (Fig.27).



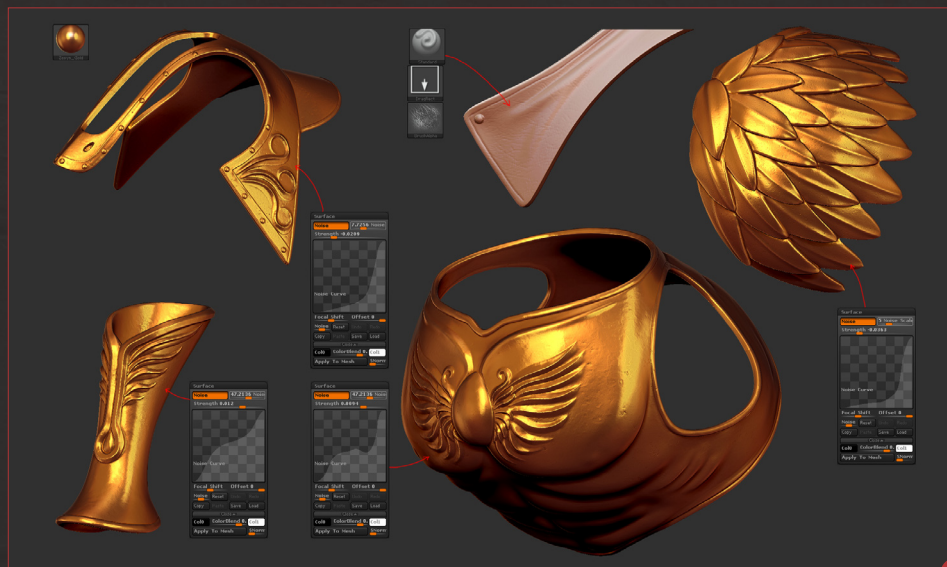
26

DETAILING THE BODY

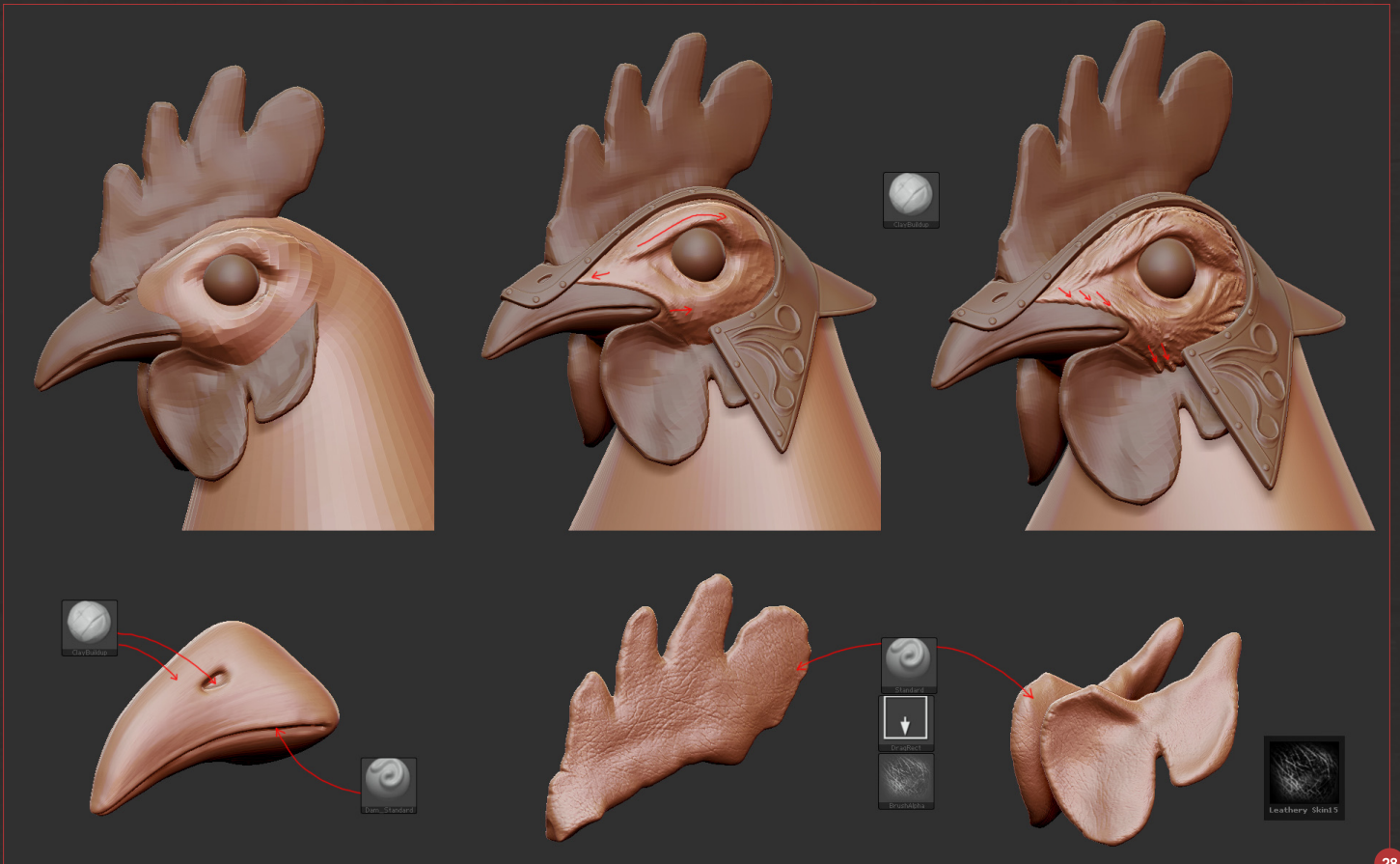
Back to the chicken body, subdivide it four times. Using the Move and Clay buildup brushes, adjust the volumes of the head and detail the connection with the beak. Mark the eyebrow, cheekbones and eyelids. I have used some strokes that overlap the beak and wattles to give the idea that the head is covered with small feathers.

Subdivided the beak five times. With the Dam Standard brush, define the beak opening. Use the Clay Buildup brush to define the nostril and draw some subtle strokes along the length of the beak to suggest its structure.

Subdivide the comb and wattles four times. Using the Standard brush in DragRect mode, load the Leathery Skin 15 alpha from the ZAlpha folder of the ZBrush installation. While pressing Alt (to subtract), drag over parts of the model



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to add the leathery texture to the surface. With the Dam Standard brush, add a few cuts at the borders (Fig.28).

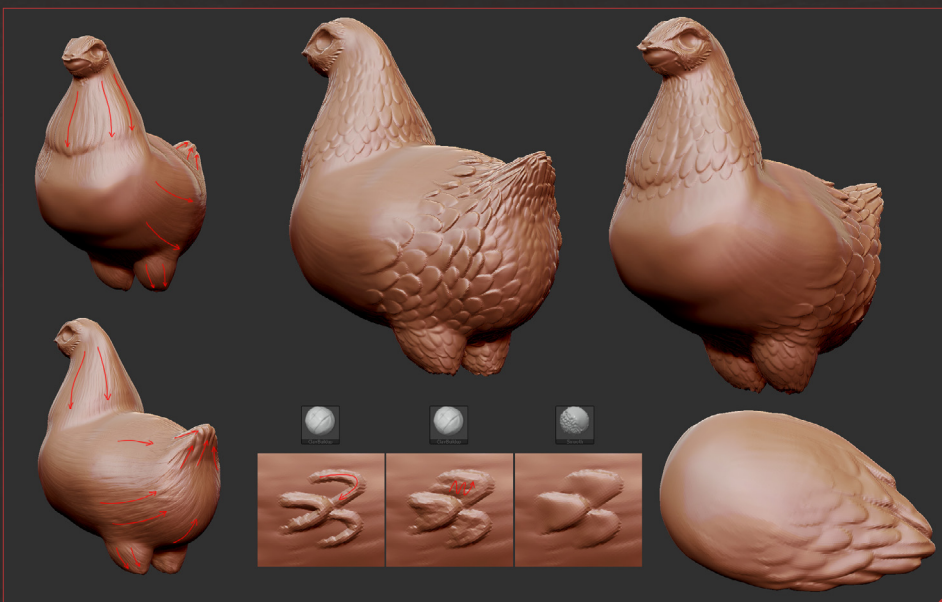
We will now create the iris of the eyes. Rotate the spheres so that the topology is coincident with the iris and the pupil is placed at one of the sphere's poles. With the Standard brush

in DragRect mode, select Alpha 48. Set the Z Intensity to 75 and Focal Shift to -54. Drag, starting at the pole of the sphere, to create the recessed iris. Change the alpha to Alpha 14 and drag from the pole to create the pupil (Fig.29).

To start working on the body feathers, use the Clay buildup brush. I started by marking the flow



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of the feathers with soft strokes to guide myself.

I also added a bit more volume at the tail to suggest some raised feathers. Then using the Clay Buildup brush, I sculpted all the feathers roughly, starting by marking the outline of the feathers, filling the inside and then smoothing the result. I only created the feathers on the areas that are not covered by armor and on the wings (Fig.30).

Then I subdivided the body twice more. Always using the Clay Buildup brush, I refined the head feathers and detailed the orbit area. To create the fleshy texture around the eye, a Standard brush in DragRect mode with Alpha 24 was used.

A highly painstaking technique was used to add detail to the feathers. With the Clay buildup brush, every single feather was detailed by stroking the center of the feather followed by strokes that represented the fur of the feather (Fig.31).

If you don't need so much control over each individual feather (or are not feeling like a glutton for punishment) I suggest a more practical technique. Start by selecting the Plane3D tool. Press Make PolyMesh3D. In the Geometry submenu, disable the Smt button and press Divide a couple of times. Sculpt a single feather on the plane. Make sure that the part of the feather connecting with the body is at a lower height than the tip of the feather (to create a ramp). From a front view, with the plane covering the full view, press GrabDoc from the Alpha menu. You have captured an alpha with the depth of the feather. Choose the Layer brush, set the stroke to DragRect and pick the feather as an alpha. Save the brush for future use.

The Layer brush has a very useful characteristic. If you store a Morph Target (press Store MT) the height of the applied strokes is relative to the surface stored as Morph Target. This allows you to create feathers under other feathers (**Fig.32**)!

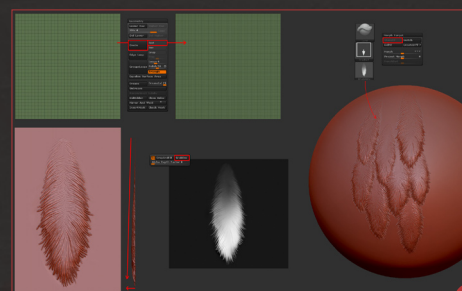
To detail the legs, subdivide and use the Clay Buildup brush once again. Start by defining the border between the nails and fingers. Sculpt around the fingers to simulate the fleshier areas.



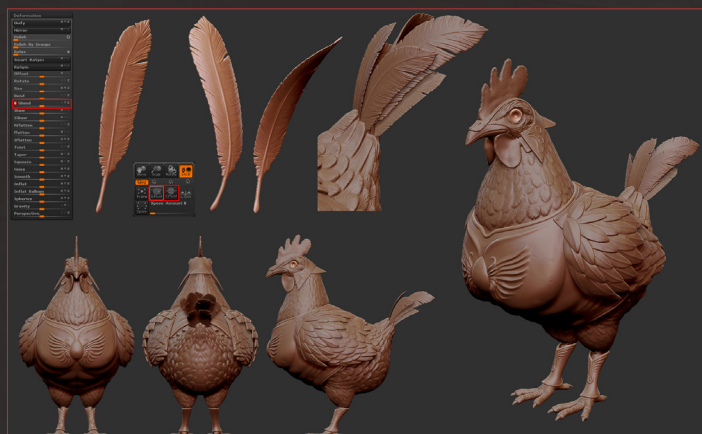
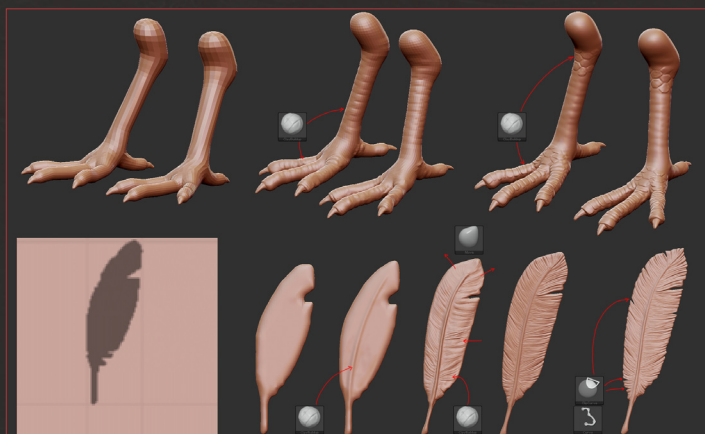
Subdivide more and sculpt the scales covering the top of the fingers and the leg in the areas that are not covered by the armor.

To model a single feather, which will be used to create the tail, use the Shadowbox technique described previously. Mark the center of the feather, as well as the fur, with the Clay Buildup brush. Use the Move brush to adjust the global shape and the ClipCurve to cut little spaces between the fur to add more detail (**Fig.33**).

Duplicate the feather, create variations and place the feathers on the tail. Start by pressing **Duplicate** to create a copy of the feather. To set a pivot point for the deformations we will apply, select the central part of the feather, making the rest hidden. In the Transform menu press the **S.Pivot (Set Pivot Point)** button.



The center of the visible selection is now the pivot. Unhide the rest of the feather. Under the Deformation submenu move the S.bend slider to bend the feather in various axis, creating a variation of the original feather. Under Transform press C.Pivot (Clear Pivot point). Move the feather and place it on the tail among the sculpted feathers. Keep duplicating the original feather and creating variations until you have a nice tail. The model is now complete (Fig.34).



COLOR

When starting painting and applying custom materials it is good to start saving your project instead of just your tool. The project file will hold all the information regarding camera views, lights and materials. Go to the File menu and choose the Save As option to save as a project.

Start by applying a white color to the full model. To do this quickly go to the Subtool Master (under ZPlugins) and choose the Fill option, then select Color. It will fill all the visible subtools with the selected color.

Download the Zeoyon_Gold MatCap from my website (www.artofjose.com under Goodies/ ZBrush). In the Material menu choose Load to load the material. Make sure that only the metal armor pieces are visible. In Subtool Master, choose Fill and then Material. The golden material will now have been applied to all the armored pieces.

Choose SkinShade4 from the Material palette, so the rest of the model is displayed with this material. SkinShade4 is a white material with a bit of specular and is great for polypainting.

To paint, choose the Standard brush, enable RGB and disable Zadd so that it doesn't sculpt while you paint. I started with the eye. First, I



subdivided it twice, because the color is stored at each vertex and this way I could paint more detail. Then I painted the iris in red and the pupil in black. To finalize it, I used a lighter orange at the lower iris and marked the outline of the iris with a darker red. The white of the eye was painted with a reddish gray color (**Fig.35**).

For the wattles and comb I used a dark red as a base. Then I changed the paint mode to Spray and the alpha to Alpha 07, and painted the wattles with a lighter value of red to make the color uneven. Under Masking I chose Mask by Cavity to create a mask for all the cracks on the skin, then inverted it and painted with a darker red to enhance the cracks.

The beak was straightforward. I filled it with pale yellow, painted it unevenly with spray and marked the mouth and nostrils with dark brown.

For the feathers, I started by filling the body, wings and feathers with a light gray. Then I made a Cavity mask, inverted it and painted the borders of the feathers with a darker gray. With the same red color as the comb, I carefully painted the area around the eyes to make a good transition between the feathers and the bare skin. Some black strokes were used to enhance the cavities around the eye (**Fig.36**).

I picked a caramel brown and painted around the feathers loosely, trying to create a gradient from the white head to the brown body. Then I used a darker brown to cover the whole body, leaving a darker color around the feathers. The tail and the individual feathers were left with a lighter color to make some contrast with the rest of the body.

The legs started with a pale yellow base. Then I have sprayed them with a slightly darker color and painted the nails in a lighter yellow. A cavity mask was used to paint the skin details with a darker color.

The shoulder straps were painted with a dark brown. Some strokes in a darker brown were



painted to make it uneven. As I wanted to give the nails a different material, I started by filling the strap with the SkinShade4 material, then I disabled the RGB button and enabled the M button, which paints the material on the surface. Then I chose the ZeoyN_Gold material and painted the chicken's nails to make them golden (Fig.37).

POSE

So far we have been busy creating the character in a neutral pose, mainly to take advantage of symmetrical editing. The pose will give us more information about the character's personality.

With the big breast and the shiny armor the chicken has got a really cocky look, so I thought that it would be funny to put her in a situation where she was surprised and broke that cockiness.

For posing a full body made of several subtools, the Transpose Master is the way to go. Select TposeMesh and a new tool with all the subtools at its lowest subdivision level are created.

Remember that each subtool will have a different polygroup, which will make it easy to hide parts while making the masks/selections. All the posing can be made using the Rotate



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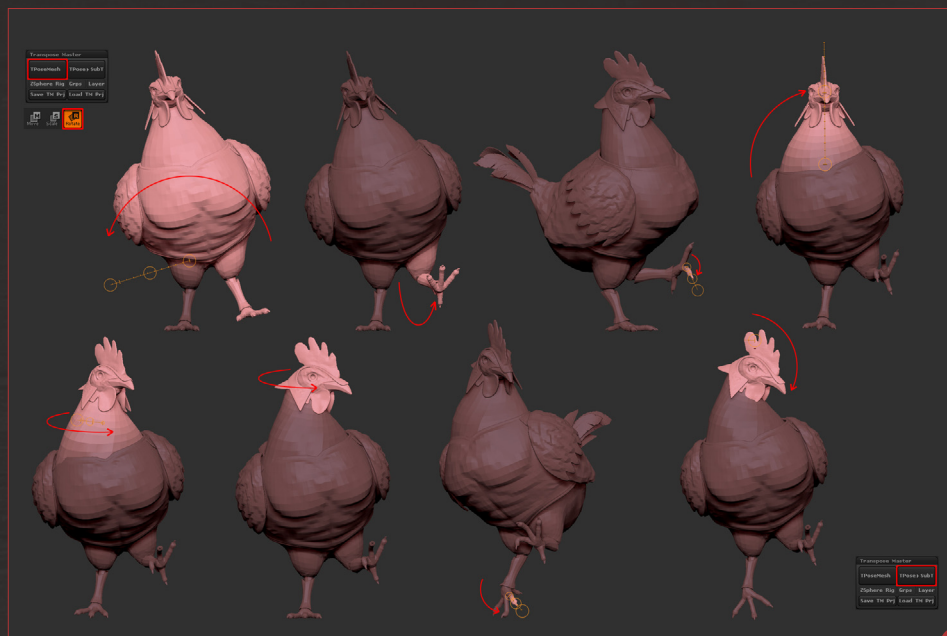
mode, by placing the Transpose tool at the joints and rotating, as if using a temporary bone.

I started by masking the right leg up to the thigh and rotated the rest of the body to put all the weight on the right leg. Then I masked everything except the left leg and rotated it forward to use the foot as protection. The left fingers were masked one by one and posed to give more expression. I masked everything from the neck up and inverted the mask, then rotated the neck to make it vertical and counterbalance the weight. Keeping the same mask, I rotated the neck to the chicken's left. Then I left only the head and all the elements that connect with it unmasked, and rotated the head further left. The planting foot was posed as if the chicken was standing on its toes. To finalize, I tilted the head forward as if the chicken was looking at the ground.

In the Transpose Master choose Tpose >

SubT and your original model will be posed (Fig.38). Then you will need to start fixing any intersection problems you might have with the Move brush. In my case I had the wattles intersecting the neck and the leg intersecting the shin armor.

To give the chicken a more desperate look I gave a bit of variation to the curvature of the comb. I selected the comb subtool and masked the parts that were supposed to stay in place, then used the Rotate mode and the Transpose tool to bend the comb. With the Move brush I lifted the eyebrows for a surprised look. I also rotated the eyes in the direction of the lifted foot (Fig.39).



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WORM

To surprise the chicken I chose an earthworm jumping out of a hole. A shouting/laughing worm came to my mind, even though the chicken might have the last laugh. The worm was made using techniques that have already been described here. I started with a ZSphere chain and then sculpted it with the Clay Buildup brush, adding detail with each subdivision. For the tongue, the Shadowbox was used to create the basic form and then it was sculpted with the Clay Buildup brush. Everything was polypainted and the SkinShade4 material was used (**Fig.40**).

GROUND

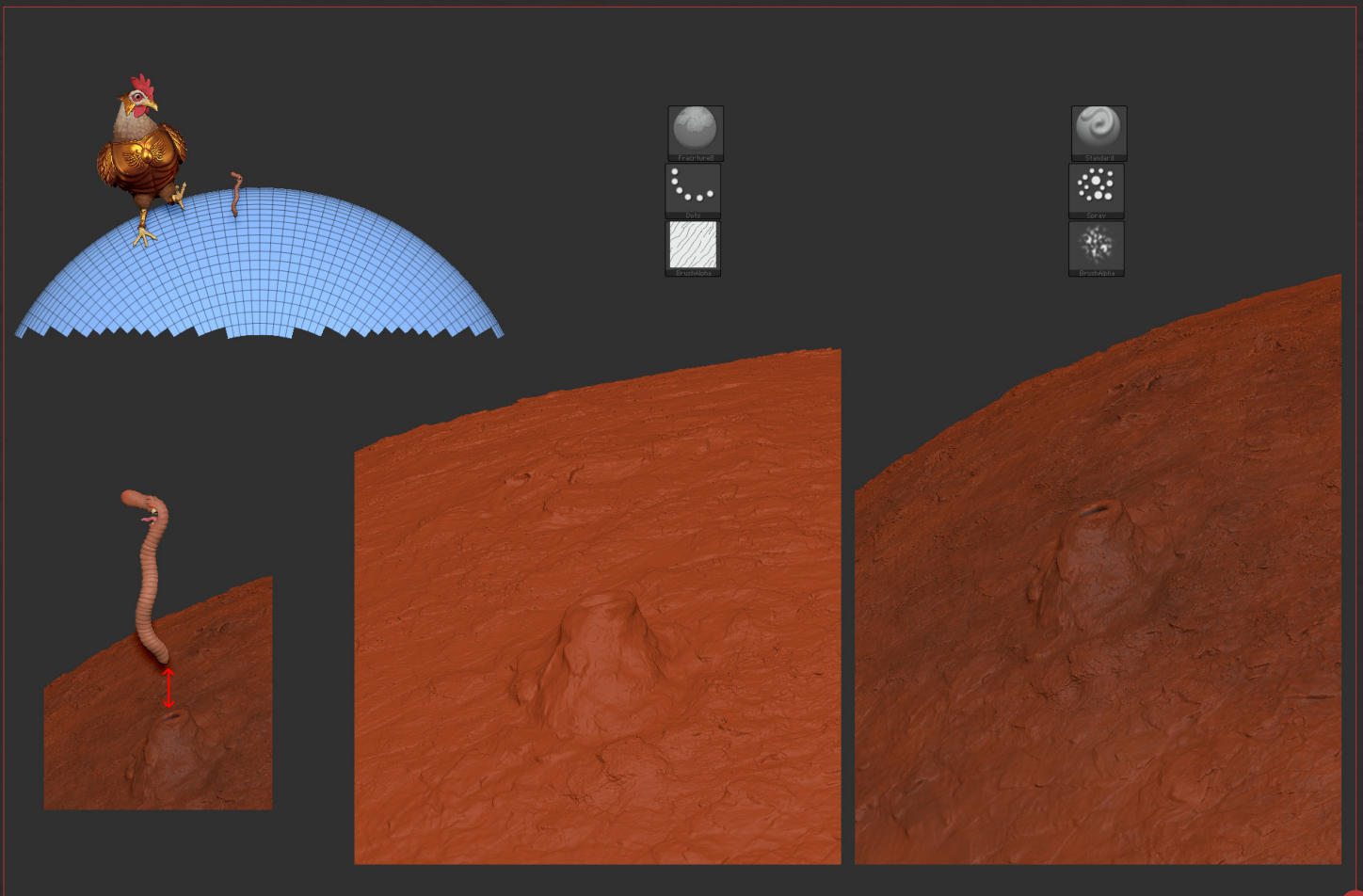
The tutorial is about a chicken and its armor so I opted for a very simple scene. I appended a Sphere3D to the tool and scaled it up as if it was a hill under the chicken's feet. Then I deleted the bottom part of the sphere and subdivided it. With the Clay Buildup tool I sculpted a hole in the ground from which the worm is jumping.



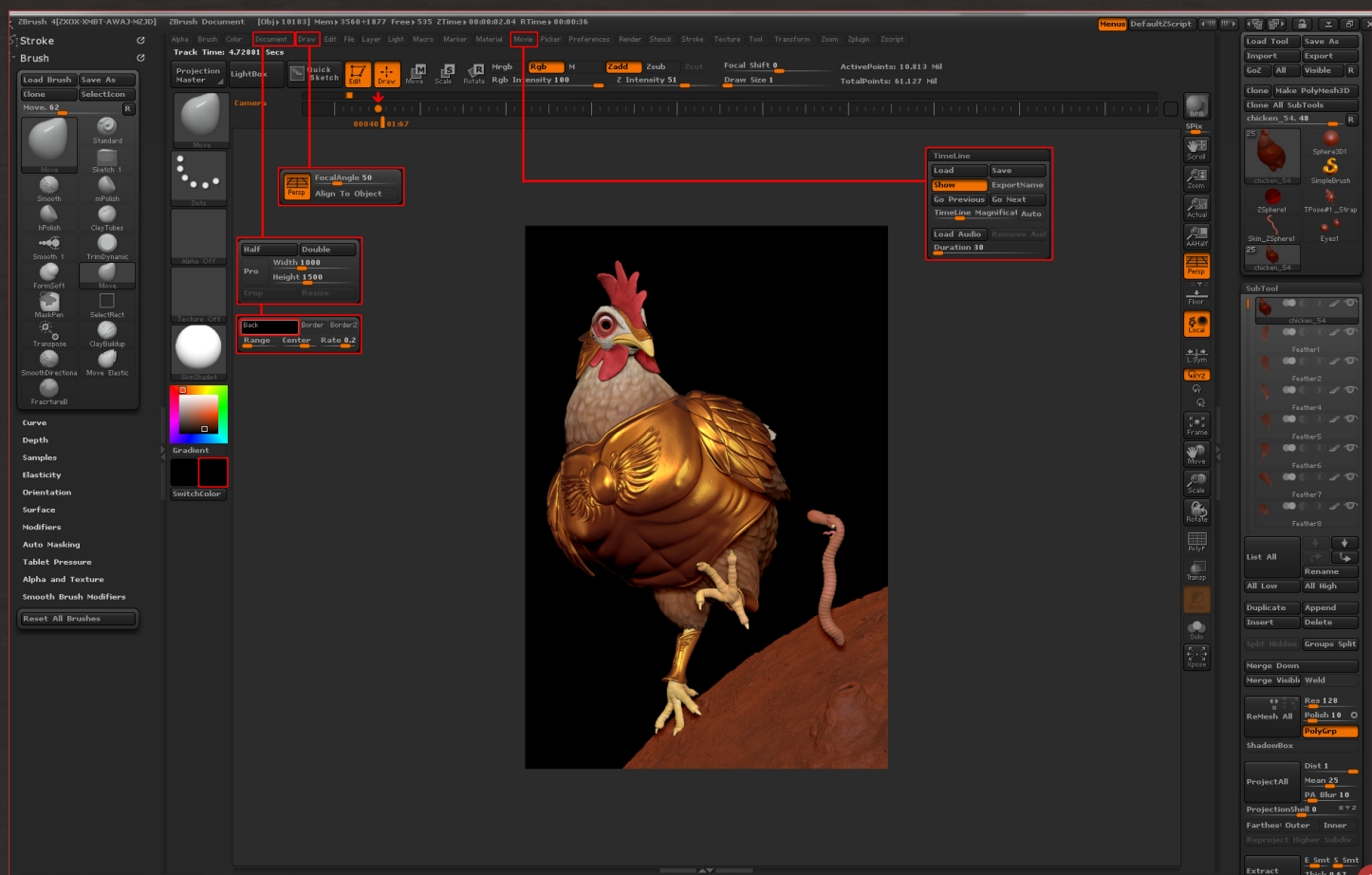
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To add some texture to the ground I used the FractureB brush that you can find in the program's directories (load it with Lightbox in the Brush dir). The painting was made with the

Standard brush in Spray mode using alpha Alpha08 and varied tones of brown. A Cavity mask was also used to emphasize the details with darker colors (**Fig.41**).



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COMPOSITION

All the elements are complete, so it is time to frame the image. In the Document menu, disable the Pro (proportional) button and set Width to 1000 and Height to 1500 (this will be the render resolution, so set it to the final resolution you'd like). Choose Resize. Press Ctrl and N to clear the screen and drag on the background for the model to show up. Activate Edit mode.

Set the background color to black by choosing black on the color picker and then pressing the Back button in the Document menu. If you have a background gradient, also set the Range slider to 0 to remove it.

Having the final image in mind, frame the characters inside the document area and position the view. Enabling the Persp button so you can have a camera view. The camera field of view can be set in the Draw menu with the Focal Angle slider.

To store the camera position, in the Movie menu under Timeline, press Show. The timeline is displayed. If you click on the timeline a key frame is created with the current view position. If you change your view, every time you click on that key frame you go back to the camera position you have set. You can keep several points of view by creating other key frames on the timeline. To delete a key frame, press Alt and drag the key out of the timeline (**Fig.42**).

MATERIALS

Light is additive. What this means is that if you render three separate images, each with a different light source, and put them together using Add mode, you get the same result as rendering a single image with the three lights turned on. Why is this so important? Because you can place each light source in a different image layer (with Add blending mode) and manipulate its intensity (opacity) as well as its color, allowing you to light the scene interactively. If you render the specular

highlights separately, they can also be layered using the Add mode, allowing us to control their brightness and color.

The strategy is to create a material without specular highlights for the base and three different specular settings (broad, medium, sharp) that can be composited in Photoshop using the Layer Dodge (Add) blending mode.

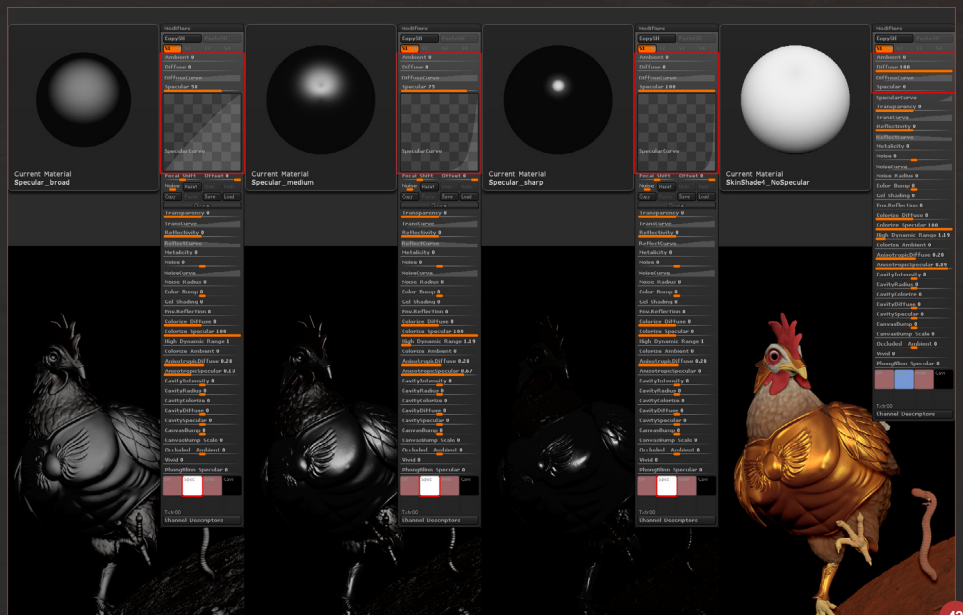
I will just explain the theory behind each material as all the settings can be found in the images. I started all the materials from the SkinShade4 material. Start by copying and pasting the SkinShade4 material to another slot (using the Copy Mat and Paste Mat buttons in the Material menu). After preparing each material do not forget to save it (Material > Save) as the project file will only keep the materials that are applied. For the base material I have set the Ambient to 0, the Diffuse to 100 and the Specular to 0 (under Material > Modifiers). This eliminates the specular highlights and the Ambient light,

only keeping the diffuse color. I saved it as SkinShade4_NoSpecular.

Then I created three specular materials, each with different glossiness. It is important that the material is fully black with a white specular. To make it black, reduce the Diffuse and Ambient to 0. To make the specular white, go to the color swatches at the bottom and change the Spec swatch to white. To create different glossiness, manipulate the specular curve of each one. I saved them as Specular_broad, Specular_medium and Specular_sharp (Fig.43).

LIGHT

I have set up the light scheme with a key light from the front and two rim lights. To create the key light, go to the Light menu and enable the first light bulb. The point on top of the sphere sets the direction from which the light comes; place it at the top right region. Set the color to white and the intensity to 0.85. Enable Shadow and set the type to Sun.

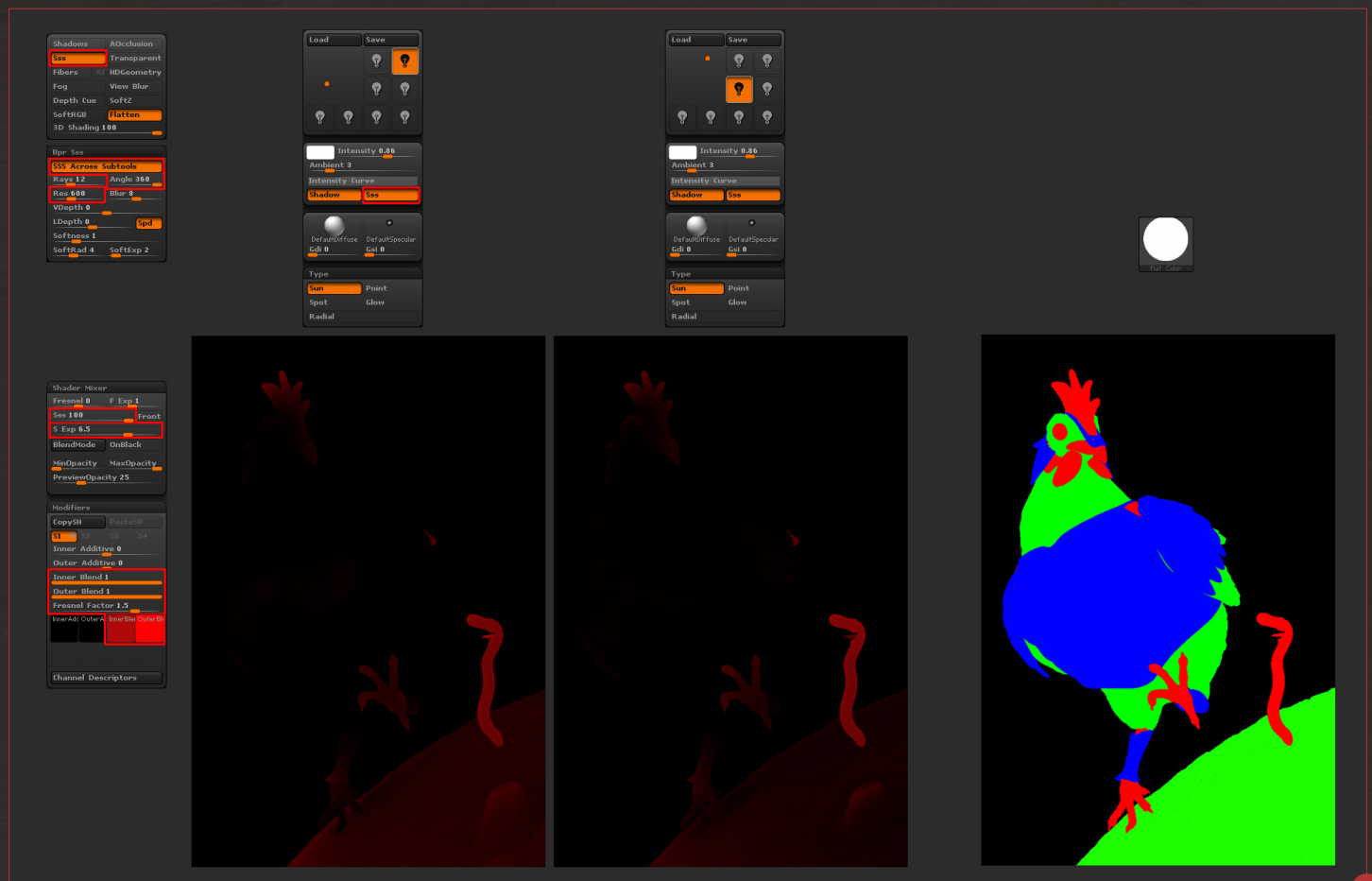


In the Render menu, enable Shadows. Under Bpr Shadow options set Strength to 1, so that there is no ambient light that would interfere with the compositing. Increase the Angle to 5 for some nice area shadows. Increase the Res value to around 4000 and set the Blur to 2. Hit the BPR button to render the key light pass.

Save it (press Gab Doc under the Texture menu and then choose Export). The render settings of the Bpr shadow will be the same for the rim lights.

To set the rim light from the left, in the Light menu disable the first light bulb and enable





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the second. Place the light point on the sphere on the lower left corner. Press Alt and click on the point so that it is moved to the back of the sphere in order to have a light coming from the back. Set the color to white and the intensity to 0.85. Enable Shadow and set the type to Sun. Render with the BPR and save it.

For the second rim light, disable light bulb number 2 and enable 3. Place the light at the top right and press Alt to place it behind the sphere. Set the color to white and the intensity to 0.85. Enable Shadow and set the type to Sun. Render it with BPR and save it. Then save the project.

You can composite the three images in Photoshop by placing each in a layer with in Linear Dodge (Add) blending mode. At the bottom put a black layer.

Enable the first light bulb and disable the others in the Light menu. Load each of the specular

materials you have created and apply them to all the subtools (use Subtool Master > Fill for this). Make a render of each with the shadows turned on.

Place the specular renders as layers on top of the lights' renders using Linear Dodge (Add blending mode). Use the Fill value of the layer to balance the layers' strength. Erase/Mask the specular layers so that the specular glossiness matches the object's (the worm should be shinier; the feathers have a broader specular etc) (**Fig.44**).

PASSES

As we have thin, soft bodies like the comb, wattles, feet and the earthworm, as well as back lights, subsurface scattering should be noticeable. To create a SSS pass, choose the Fresnel Overlay material. In the Material menu, under Modifiers, change the Inner Blend color swatch to a medium red and the Outer Blend color swatch to a bright red. Set the Inner Blend

and Outer Blend values to 1. In the Shader Mixer options, set the SSS value to 100 and S Exp to 6.5. Apply the material to all subtools.

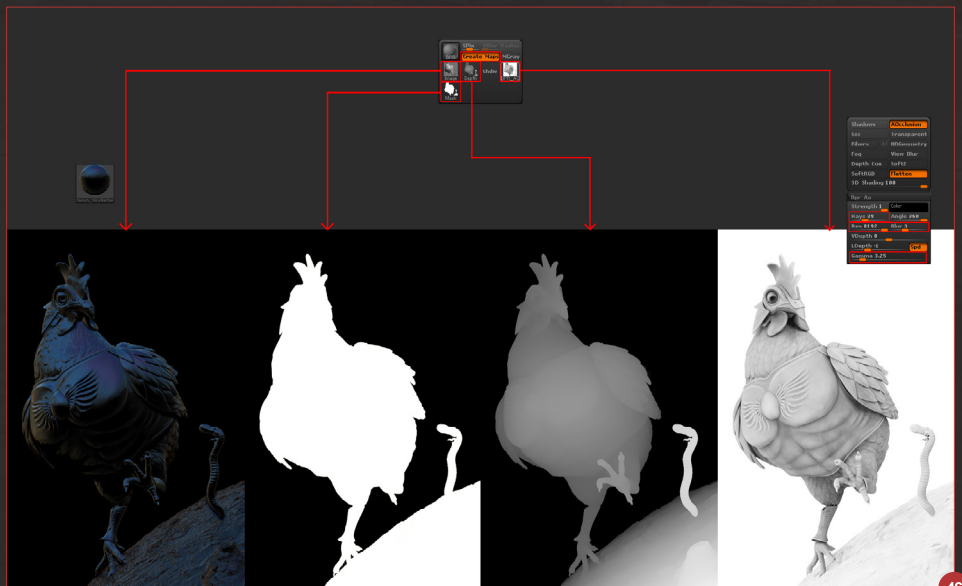
In the Light menu, enable SSS on the light that you want to generate the SSS. In the Render menu, enable SSS. Under Bpr SSS enable SSS Across Subtools, set the Angle to 360, increase Res to 600. Render with BPR. Save the image. The SSS image can be composited with a layer in Linear Dodge (Add) blending mode. Use a low Fill value as the effect should be subtle.

To create masks that will help you with selections, apply a Flat Color material to all subtools. Then apply a color to each subtool in order to easily select them in Photoshop (**Fig.45**).

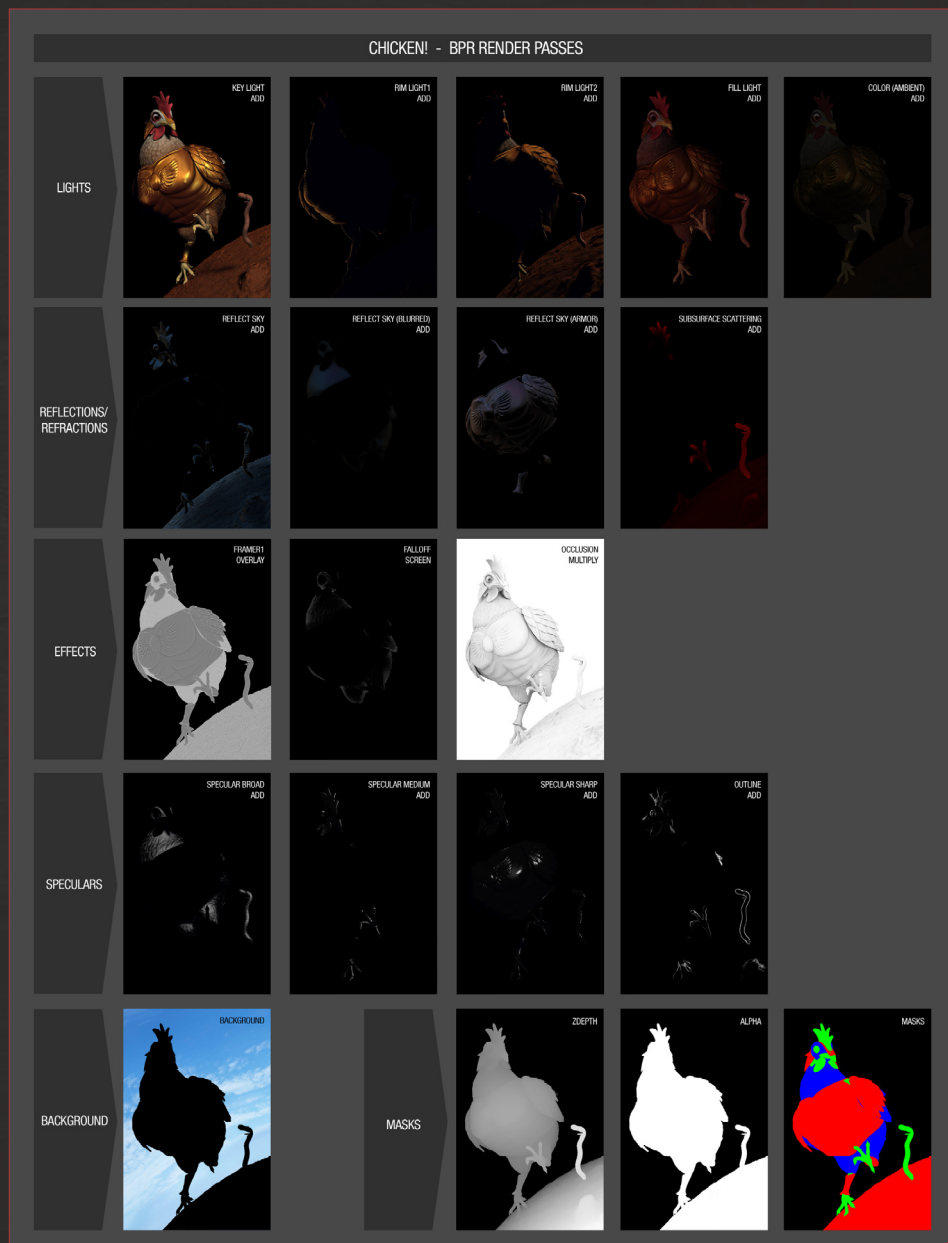
For a material that emulates the reflection of the sky go to my website and download the Zeoyn_SkyReflect1 MatCap from the Goodies/ZBrush section. Apply it to all the subtools.

To generate several useful passes together with the sky reflection, enable Create Maps in the Render menu. In the render settings disable Shadows and enable Aocclusion. Under Bpr Ao increase the rays to 40, set the Res slider to the maximum, Blur to 3 and Gamma to 3.25. Press BPR to render. Go to the Render menu and notice that under the Create Maps option you now have four images. Click on each of them to save the image of the reflected sky, the ZDepth, Ambient Occlusion and Alpha.

Use the Ambient Occlusion in a layer with Multiply blending mode set. Place the layer under the specular layers in order not to darken



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the specular highlights. The sky reflection can be added with the Linear Dodge (Add) blending mode and erased/masked to your liking. The ZDepth can be used to create a fog effect or as a mask for a depth of field effect. Use the alpha image to cut the objects from the background if you want to add a background image (**Fig.46**).

I have set a diagram showing all the BPR render passes I have used to put the image together. Each thumbnail shows the render pass after masking and color correction. I've also indicated the blending mode used on each pass. You will notice that I had the need to add a few more passes, like a fill light to lighten the shadows, and some effects using some default MatCaps, like Outline and Framer1. It is so easy to create new passes so feel free to experiment and add your own, creating your own style (**Fig.47**).

I hope you have enjoyed the tutorial!

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<http://www.artofjose.com/>

Or contact him at:

joalvessilva@netcabo.pt

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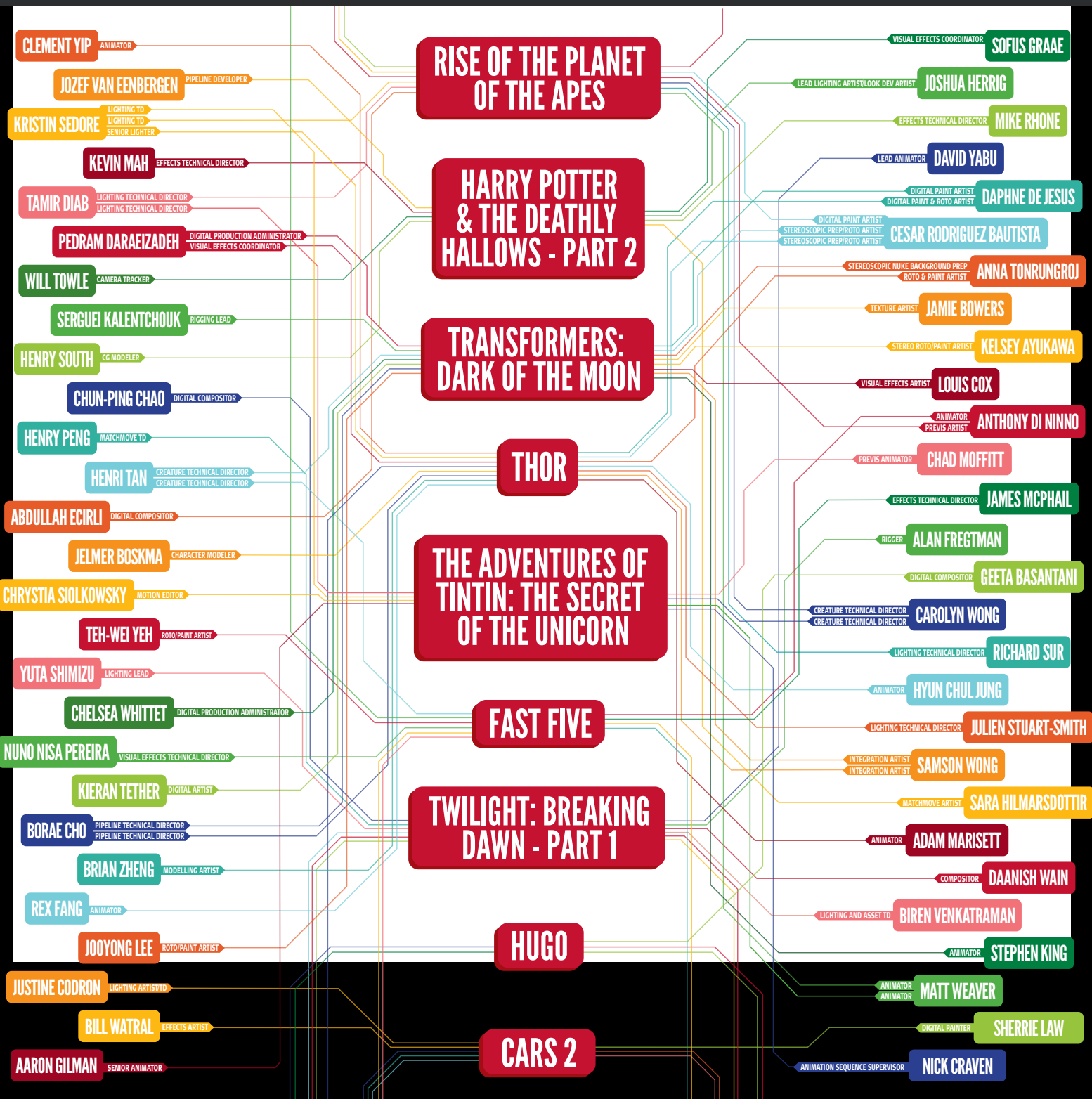


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TOPOLOGY



With all topics and skills there are core subjects that must be considered and understood in order to get the best results. When working in 3D, one of those is topology. In this series of tutorials Diego Maia will be talking us through the creation of his interesting character, whilst explaining the intricacies and importance of this fundamental subject.

DECEMBER ISSUE 076

Chapter 01 | An Introduction to Topology

JANUARY ISSUE 077

Chapter 02 | Limbs and Accessories

FEBRUARY ISSUE 078

Chapter 03 | Cleaning up and Adjustments

THIS ISSUE

Chapter 04 | Hard Surfaces

CHAPTER 04 – HARD SURFACES

Software used: 3ds Max

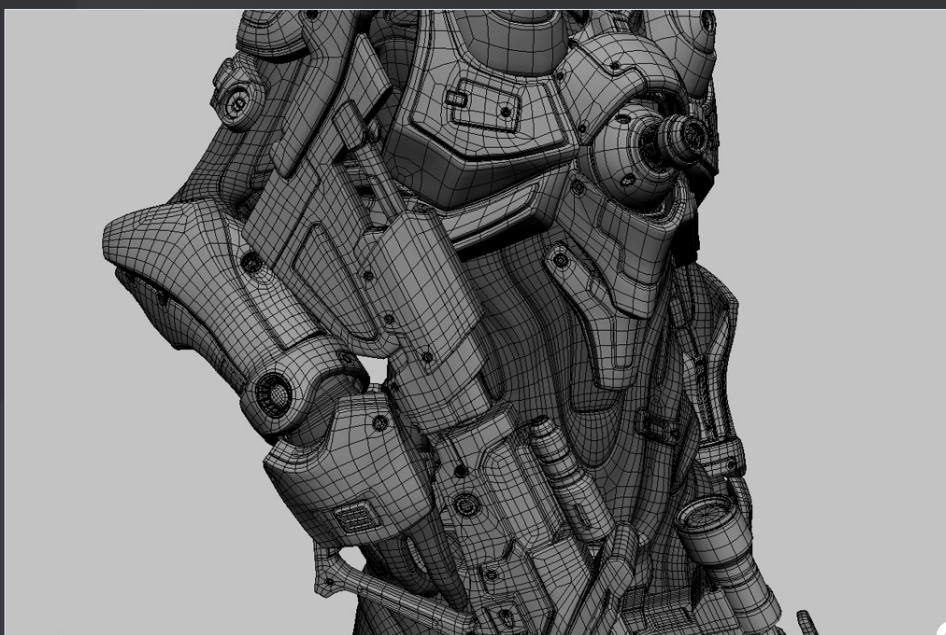
This is the final chapter from our tutorial series about topology and we're going to be talking about hard surfaces. As I explain the process I'm going to model a high-tech rifle based on a personal design (**Fig.01**).

In **Fig.02 – 03** you can see a sketch and a 3D render of the rifle I designed.

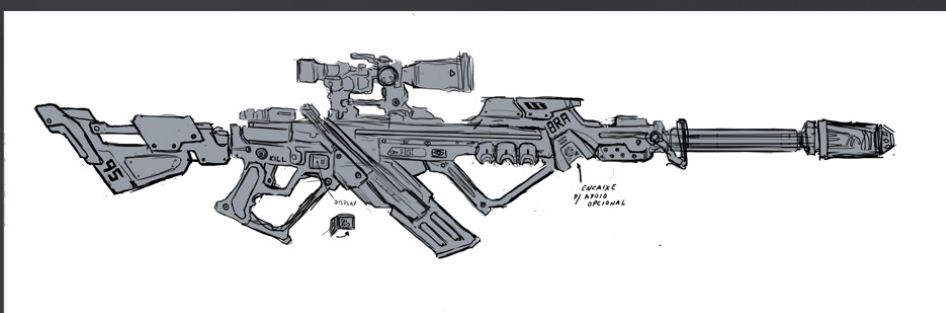
For simple forms and objects such as this, box modeling is very effective in most cases. Usually it is not necessary to use ZBrush, but if the model has an organic design with detailed lines or flat shapes ZBrush can be very helpful. In this case I will work with box modeling, but will describe the retopology process.

The strategy here is to draw the topology on a flat model and when you have done this, correct the loops so we can extrude the volumes and detail, in order to keep the shape even with no subdivisions.

At this point we can work with one plane and try not to take the vertexes of the axes to avoid wrinkles (try to move in X, Y, Z as much as possible). We're also using symmetry, since the weapon has symmetrical sides (**Fig.04 – 05**).



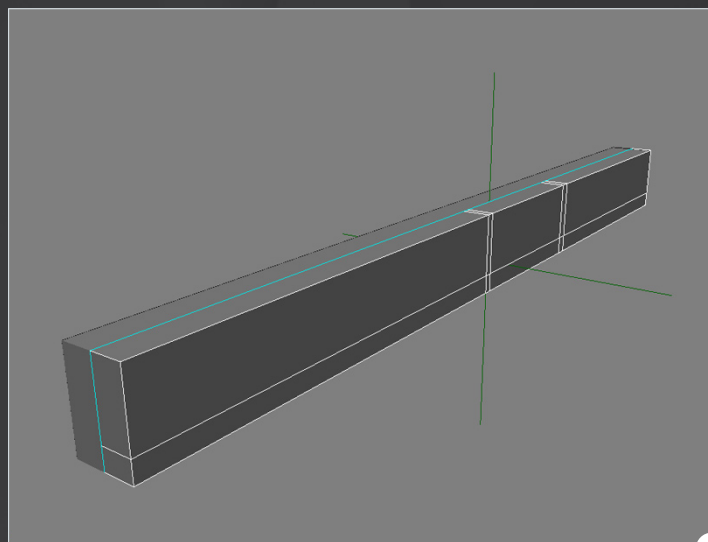
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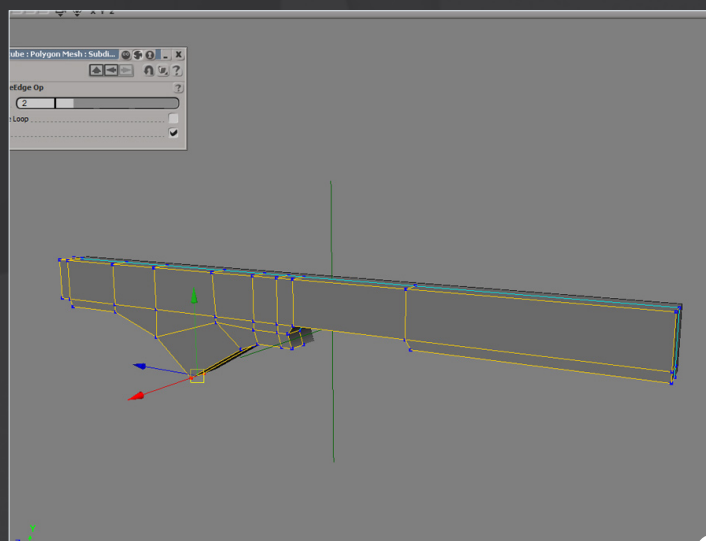
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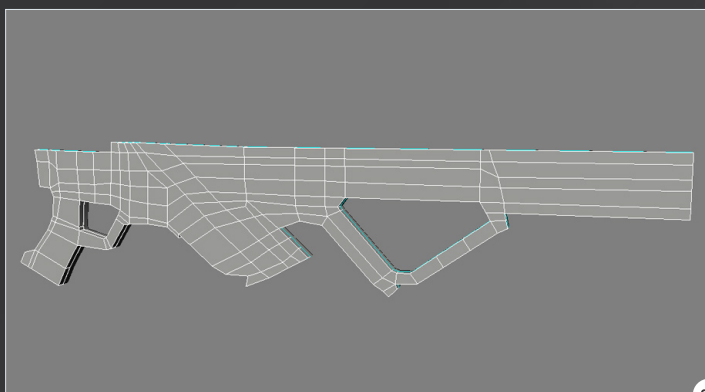
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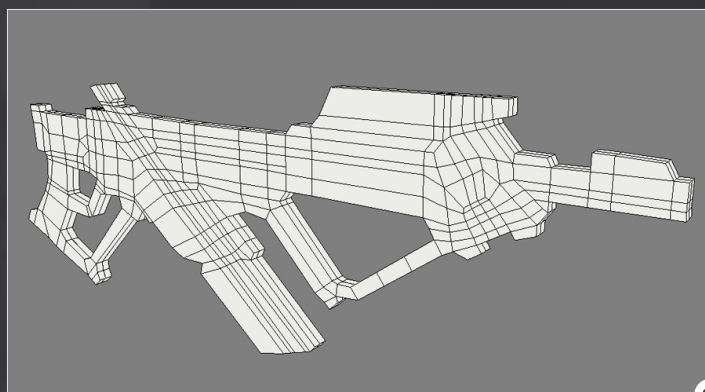
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07

In **Fig.06 – 07** we can see that the shape of the weapon has begun to appear already, but without any extrusion. I have simply just drawn the outline of the general form and organized my topology on the inner part. Now we have everything in place we can extrude the volumes of the different pieces and start adding cuts to sustain the hard edges (**Fig.08 – 10**).

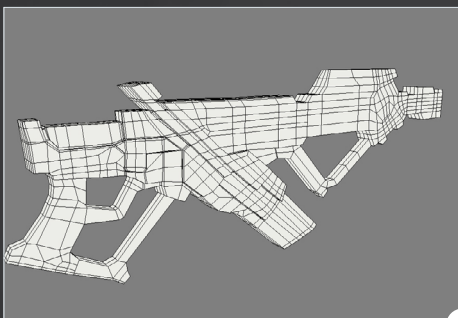
Avoid using the Chamfer tool too much (or the Bevel tool for XSi users). Instead, try adding edges as it allows you to fix details easily.

In **Fig.11 – 12** we can see various screws and small details on the weapon. Try to always make the round forms with six or more sides. Avoid circles with four sides. It's too low when the model's not subdivided.

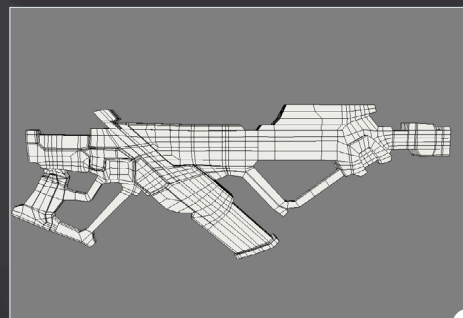
I use cylinders to get the geometry for the barrel of the gun and tip (**Fig.13**). This method is much more convenient than using retopology.

Note that even when doing inorganic modeling, I try to keep an average size and distance between the loops (**Fig.13**). Even if we don't have blend shapes we must have the topology well-distributed in order to not have problems with textures and UVs slipping. So as in previous chapters, let's try to keep an average size and distance between polygons.

Use the same process for the weapon's support (**Fig.14 – 15**). Begin by drawing the topology on the flat piece. Then extrude volumes after all the topology is in place. After you have done this



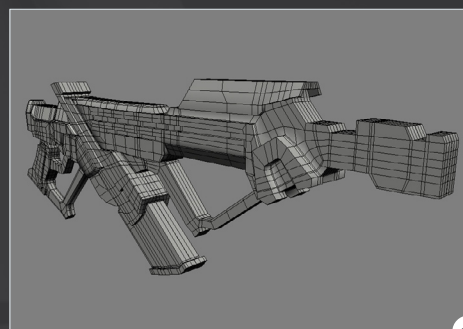
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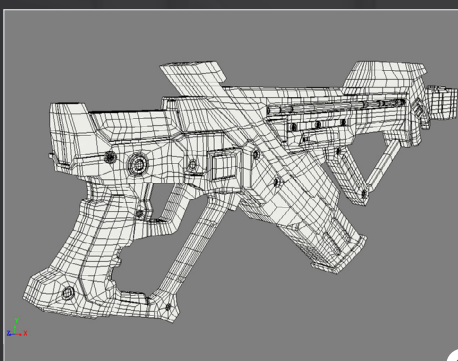
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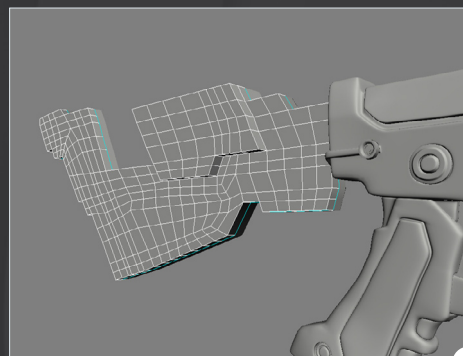
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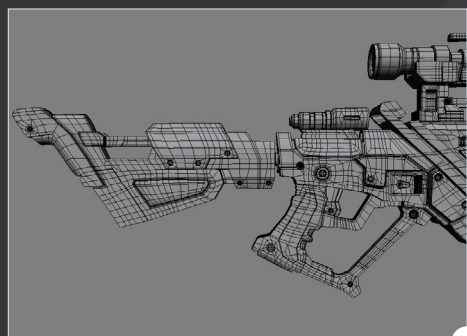
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15



16



18

you can add even more details if you want to. I created the sight from separate geometry. In this case, we do not need all the pieces in the same mesh. It is important to not be able to see where one set of geometry joins another.

Note that you can use several divisions to keep the round shape, even without subdivisions. In this case our circle would be very low poly even with six sides (**Fig.16 – 17**).

Here are some close-ups of our final topology (**Fig.18 – 19**).

You can see the final model rendered in **Fig.20**.

That's the end of our series about topology. I believe that practice improves your ability and optimizes the process. I hope these tips help and I hope you enjoyed the tutorials. Thank you for reading this article.

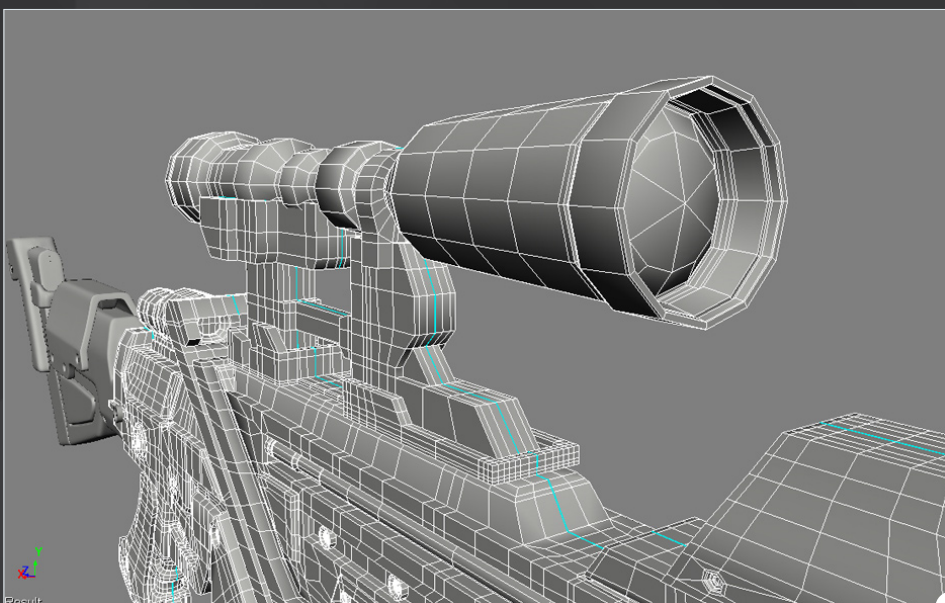
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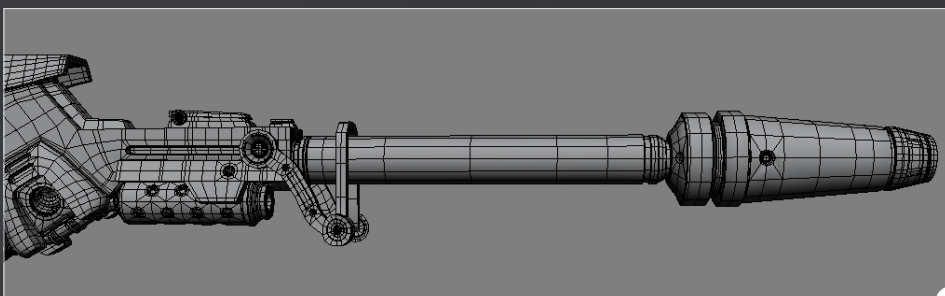
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17



19



20



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MAKING OF **RALLYPOINT** **-OUTER RIM** BY TAMÁS GYERMÁN

Tamás Gyermán explains to us how he created his amazing image, *Rallypoint – Outer Rim*, using sci-fi films as inspiration and his excellent skills in Photoshop. He tells us how mastering important aspects such as light and camera angle will help you to create the perfect sci-fi scene!



“MY STARTING POINT FOR THIS IMAGE WAS TO, IN GENERAL, THINK ABOUT STANDARD SPACE SCENES. THEY USUALLY CONTAIN STAR FIELDS, CLOUDS, NEBULAS, MOONS, STARS, ASTEROIDS AND, OF COURSE, STARSHIPS!”

RALLYPOINT - OUTER RIM

Software used: Cinema 4D

INTRODUCTION

Welcome! My name is Tamás Gyermán and this is a short description about one of my images, *Rallypoint - Outer Rim*.

The inspiration for this image came from two great sci-fi films: *Chronicles of Riddick* and *Homeworld*. I tried to imagine how to create a sci-fi fleet that would suit the Necro Armada and the Turanic raiders. I wanted my fleet to look as if it was travelling across space and collecting what it finds, almost as if they were space pirates. *Stargate* also influenced my designs. When I had all of this in my mind I could start creating my fleet.

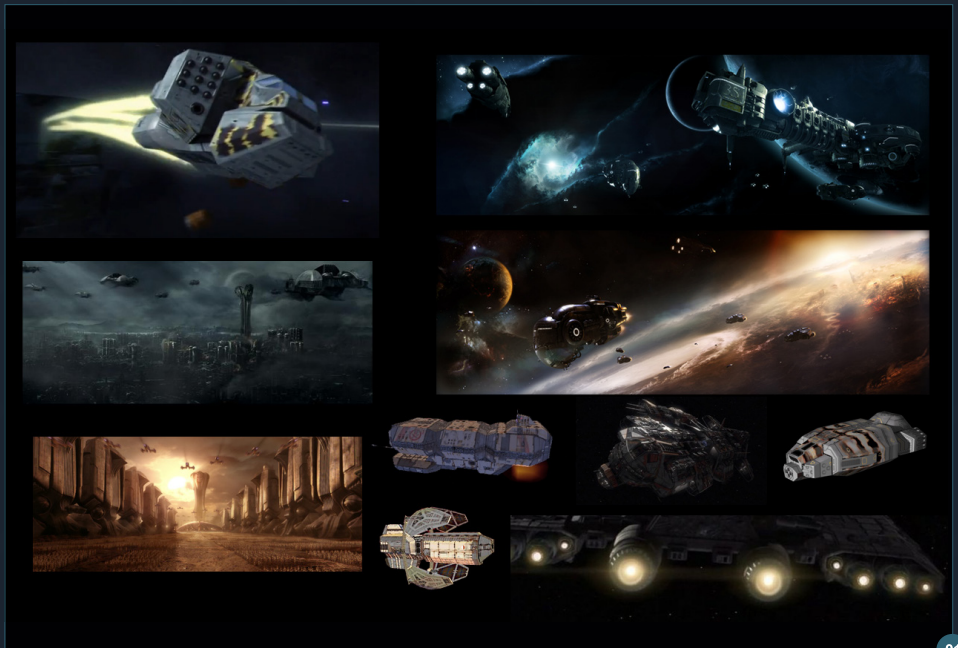
I wanted to create a group of images that showed the fleet in different environments, but unfortunately I didn't have time to complete the set. But I have created two images: *Get my fleet off the orbit* and this image, *Rallypoint* (Fig.01).

CREATION

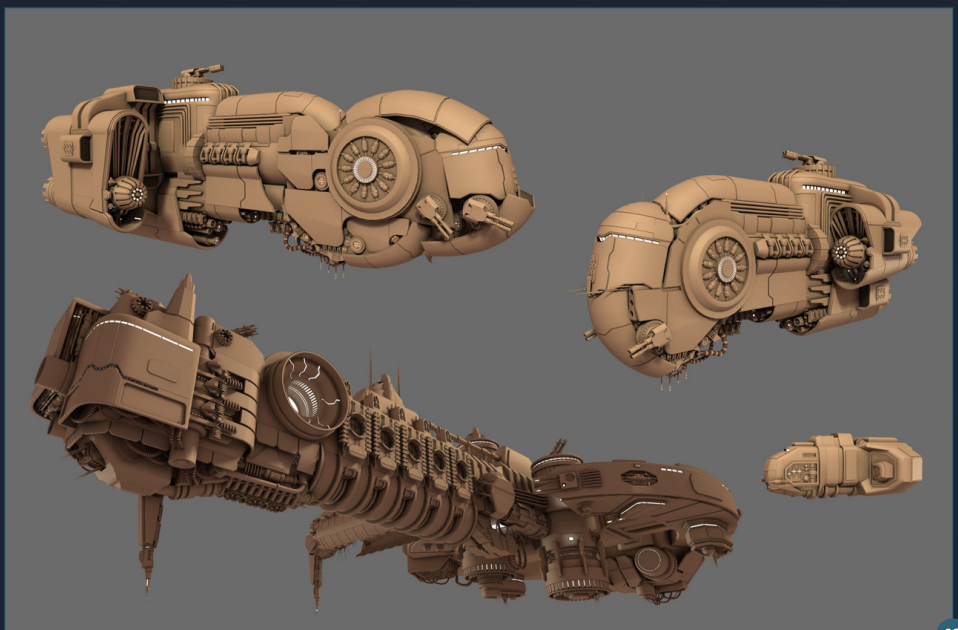
My starting point for this image was to, in general, think about standard space scenes. They usually contain star fields, clouds, nebulas, moons, stars, asteroids and, of course, starships!

SHAPES AND DESIGN

My idea was to show a medium-sized ship, which was covered in lots of hard, connected plates and that had large, maneuverable engines. I wanted it to have powerful, but slow, weapons and to be well protected from above and from the side. I wanted the lower parts of the ship to show quite a lot of cables and technical elements as this would be the most vulnerable section. I created a rough base mesh from simple shapes and then started to bend things into the shape that I wanted. By adding arches and a bent surface it gave an ancient look to the ship (Fig.02).



01



02

Whilst creating this model I thought carefully about the overall scene. I wanted the scene to be set by a massive dark nebula deep in space, which could be a rally point for ships to go to. The overall idea is that this could be on the edge of a planet's space empire. The main elements of the scene are the space station and a massive dust cloud. The station is a 3D model and the dust cloud is a matte painting.

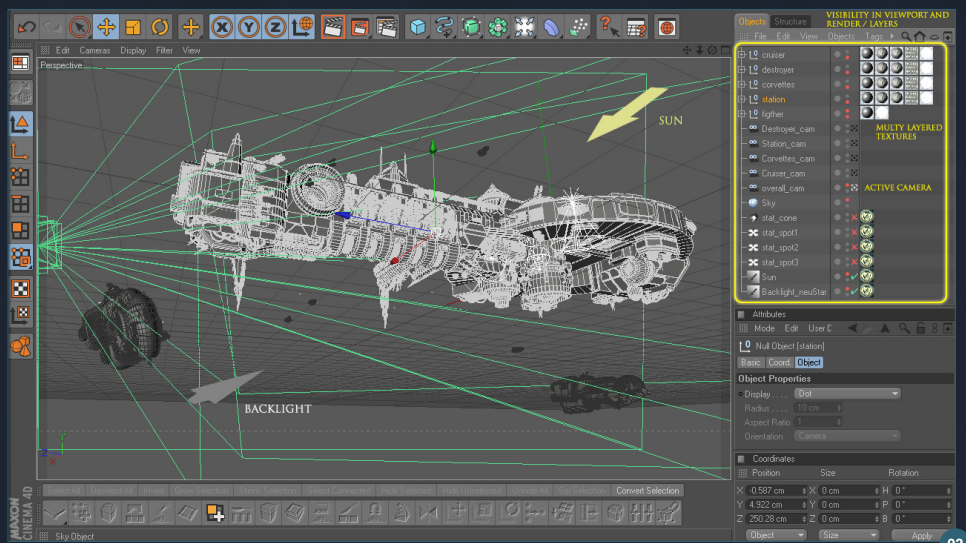
After I had created the model I thought about how I could make this model work in my scene. I needed to set up some good shaders, a good

camera angle and lights. The approach I was using was to make the separate parts and then place them in the matte painted scene, which is a great technique to use if you don't have a very powerful PC.

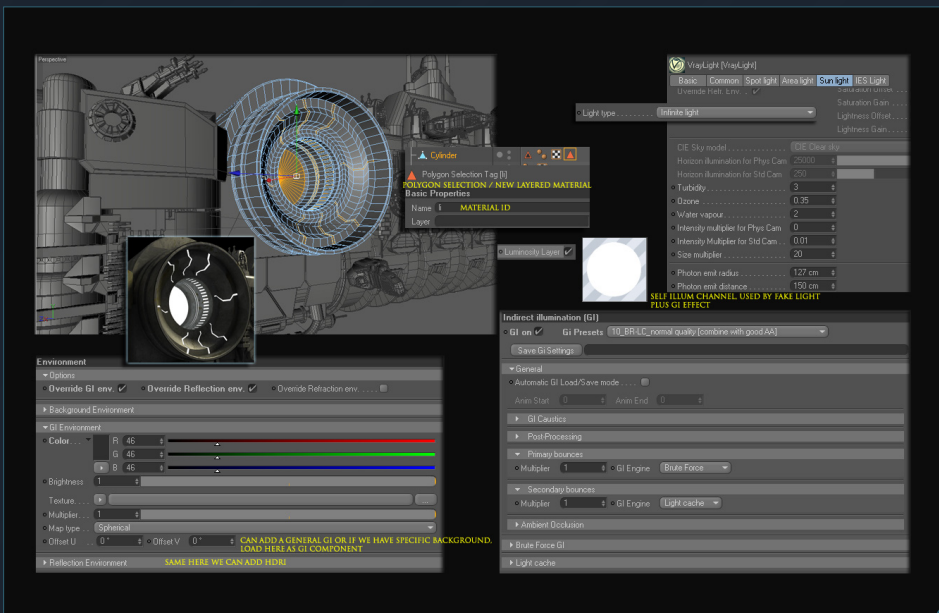
Because the scene I had in mind was very wide, it meant that I needed to set up all the elements in a scene together to ensure that the lighting and perspective were consistent. I had to work out how I wanted the final scene to look and render the models with the correct perspective so that they could be composited later in

Photoshop. This, however, meant that I could still render the models separately so they could be composited in Photoshop later (Fig.03).

Lights are always important in every scene. They tell us the time, season, weather and, of course, play a huge part in demonstrating the drama of the scene. Space is obviously always very dark, which means I had to use more lights and ambient GI in the scene. In general, a soft, gray, ambient GI is enough. As I had a specific idea for the background I used the nebula's color as the ambient light color. The other option is to use the environment as a HDRI.



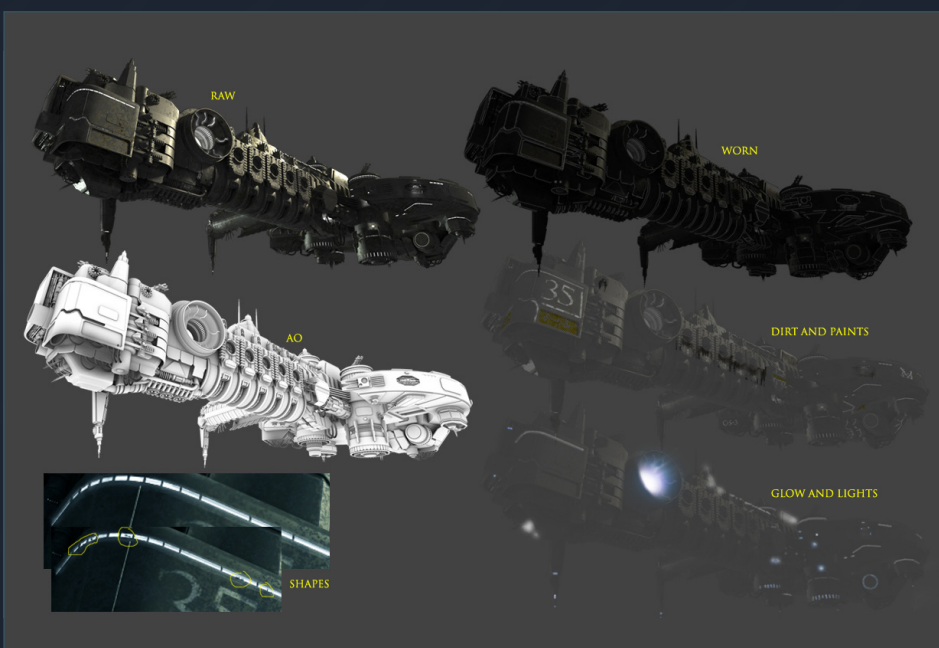
03



Spaceships are usually made up of metal, cables and lights. The self-illumination settings are very useful when creating the individual lights. In game development, self-illumination is used a lot to create the smaller lights that don't play part in the overall lighting of the environment. The Cinema 4D version of 3DTotal's *Celeritas* eBook tells you how to set these up (Fig.04).

After I had rendered the raw image and an AO pass, I painted in some wearing and abrasion on the parts that are most likely to have been bumped around. This adds to the sense of realism. I also painted in some bright spots and glows on the surface of the ship.

04

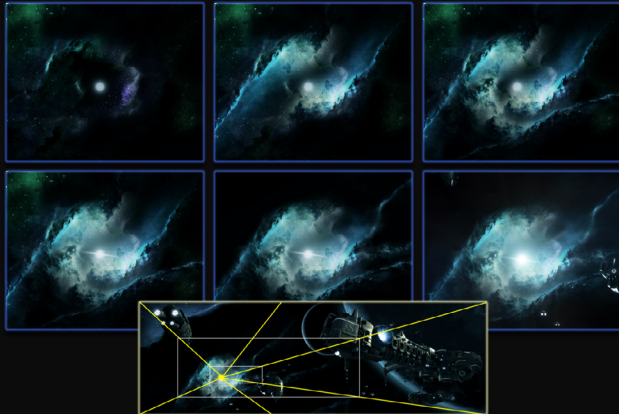


If the image is going to be big enough that people will be able to see the windows I suggest painting in some characters or machinery as it adds a human element to the cold machinery (Fig.05).

The next part was to see if I could paint the dust cloud in the background. To do this I used alpha brushes set to a soft opacity. This has to be done carefully by eye. I started right in the center, creating the bright, white light, and then moved on to the blueish cloud shapes around it. To do this I also used some photos of clouds.

After the main shape was created I added some faint dust over the top of the bright parts to add

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a sense of depth and added a lens flare to show how bright the light is. It is really important to paint the dust in carefully as it almost needs to look as if it is moving with the dust cloud (Fig.06).

The planets in the scene have a big impact on the overall scene. It is important to show the rim

light on these and keep the actual face of the planet only very slightly lit. I used photos to add the craters and the damage on the surface of the planet. I used different blending modes to blend the pictures with the surface of the planet. In Fig.07 you can see all of the small elements in the scene.

This Making Of shows how I made the second image from my planned series of three images. I hope knowing my process is helpful (Fig.08).

TAMÁS GYERMAN

For more from this artist visit:

<http://www.wmelone.com/cinemorx/index.html>

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3DC next month

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This month we feature:
“NUDE WOMAN”

BY JIAN XU



The following shots of the “Nude Woman” book pages are featured here in full-resolution and can be read by zooming in...



NUDE WOMAN

BY JIAN XU

JOB TITLE: Modeler

SOFTWARE USED: 3ds Max, ZBrush, Photoshop



INTRODUCTION

I have seldom worked with female anatomy. My portfolio includes work relating to soldiers, animals and different male categories. On this occasion I decided to try and create the body of a woman in a unique pose. A woman's body is soft and capable of displaying beautiful form and certainly presents a challenge! During the preparatory phase, I focused on choosing a unique pose which I considered critical for this work. Initially I searched through a great number of photographs of women's bodies to find an idea. Some proved enlightening and inspirational, however, I did not want to copy a photograph so I found a female model and shot almost one hundred photos. On the whole, I don't like to show frontal nudity and sensitive parts of the anatomy, but rather opt for a sense of implied, aesthetic feeling. Eventually I chose a curled up pose on the floor, suggesting she was resting or deep in thought. This conveyed a great shape that I liked and so I took a host of photos from different angles of this pose in preparation for the modeling phase.

MODELING

Sufficient preparation provided a good direction during the modeling stages. To begin I found a basic female body I had previously made and introduced some simple rigging to create the posture (Fig.01). After fixing the pose, I increased the mesh in order to work in ZBrush later where the main job was modifying the



67



shape and creating details. During this phase, I tried to make the model match the reference from different angles, which cost me a lot of time (Fig.02). But I think it was necessary as modeling is the most important part of an entire work. Small variations can produce big differences once lighting is introduced (Fig.03). I also spent a lot of time on the hands, which

is very important and an aspect I wanted to focus on as, for me, creating soft, natural and realistic hands is a big challenge (Fig.04).

HAIR WAS ONE OF THE HARDEST COMPONENTS IN THIS WORK

TEXTURING I have always been used to hand-painting textures instead of using photos. Photo textures already contain specular highlights and shadows, which probably do not match the final effect of light and rendering. I used three maps to paint the texture (Color map, Bump map and Specular map) as well as integrating



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TITLE OF SECTION



69

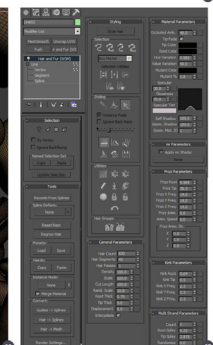
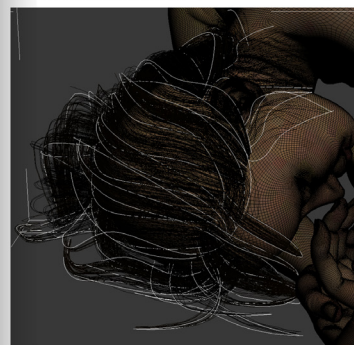
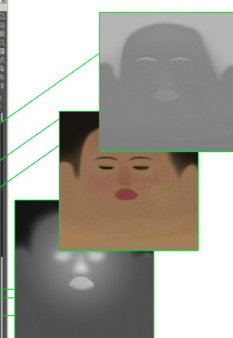
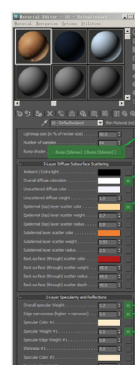
SSS in mental ray. Regarding the Color map, the challenge was making a real skin color and texture. I first painted a general color and gradually added more and more details, such as moles, vessels and spots. I then used the Bump map to create some slight details, such as pores. The Specular map was used to control the area and size of highlights, such as the details on the lips and nose (Fig.05).

HAIR

Usually I create hair using Hair FX, but I tried the default 3ds Max hair this time as it renders well in mental ray and achieves high quality shadows and shader solutions. There is, however, a problem in terms of rendering duration. Hair was one of the hardest components in this work. She has long hair, which is hard to control, so I needed to separate the hair into several groups, each controlled by a lot of curves (Fig.06). I think it was the simplest way to sculpt a good hairstyle. Fig.07 shows the settings I used.

LIGHTING

I wanted to portray an indoor environment full of artistic feeling and a photographic style, and



69

TITLE OF SECTION

The following shots of the “Nude Woman” book pages are featured here in full-resolution and can be read by zooming in...



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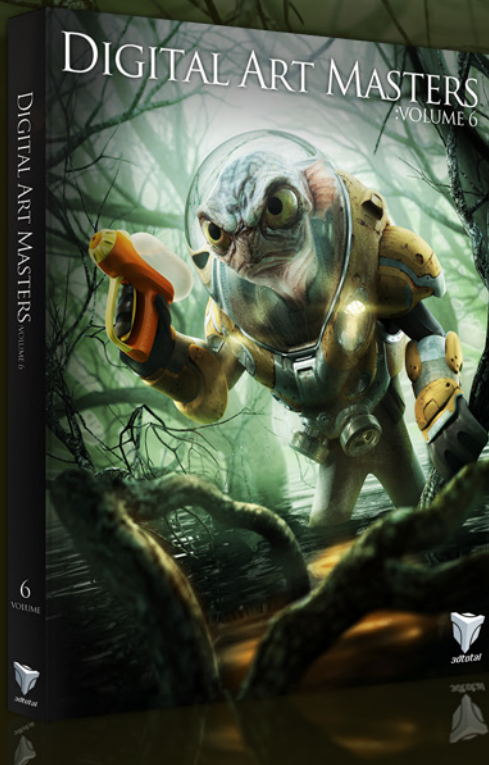
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SWORDMASTER 2



CHAPTER 6 – RENDERING

In 2006 3DTotal created some groundbreaking training that quickly made a name for itself as one of the best 3D training resources available; that series was called the Swordmaster! Well five years later the Swordmaster is back and better than ever. In this series industry professional Gavin Goulden will be talking you through how to take a concept and turn it into a top quality character ready for use in a game. From basic modeling through to sculpting and texturing, Gavin will cover every step in great detail so that even an inexperienced 3D artist will be able to comfortably follow this series.

CHAPTER 1 | OCTOBER ISSUE 074
Base model

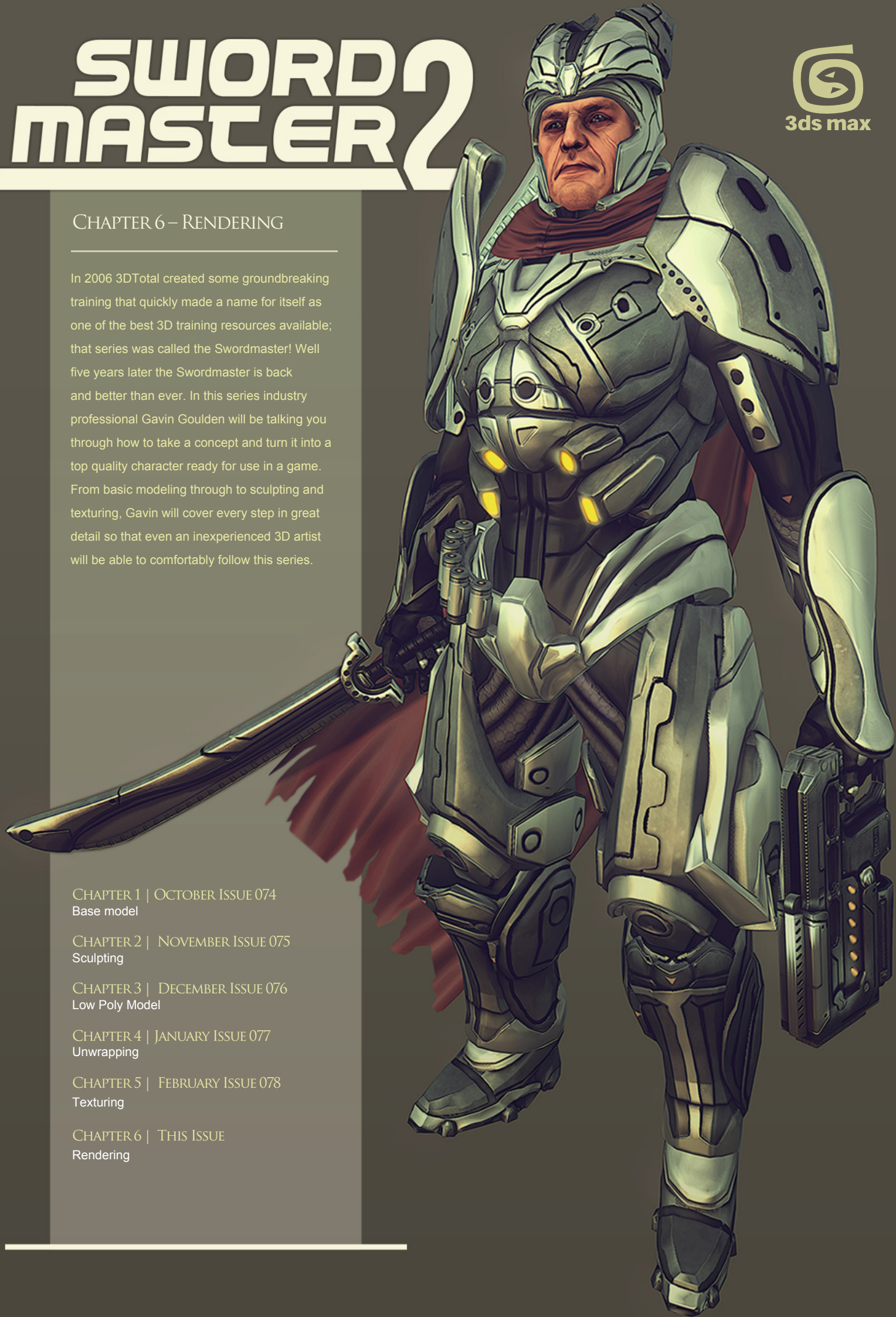
CHAPTER 2 | NOVEMBER ISSUE 075
Sculpting

CHAPTER 3 | DECEMBER ISSUE 076
Low Poly Model

CHAPTER 4 | JANUARY ISSUE 077
Unwrapping

CHAPTER 5 | FEBRUARY ISSUE 078
Texturing

CHAPTER 6 | THIS ISSUE
Rendering



CHAPTER 6 – RENDERING

Software used: 3ds Max

INTRODUCTION

In this chapter we finish off the Swordmaster 2 series by covering some simple rigging techniques, including how to weight your character model to a skeleton. After this we will look into posing your character in both extreme and neutral action shots, and finally bringing it all together in Marmoset to create a final image for your online portfolio.

Adding a pose to your character can really bring it to life. Dropping the character out of a static bind pose not only looks more “finished” to the viewer, but it can also help sell what type of character it is by displaying emotion and attitude.

To begin, grab a clean version of the final low poly model. This means clearing off any materials that may have been on the character, and double-checking that there are no floating vertices that may cause issues, all of the elements of the model are properly merged together (discovering that a part of the model is not attached to the main element can be a stumble block if left for too long) and that none of the faces are flipped. I even go as far as exporting the model and importing it into a fresh scene. The reason for this is that it is much easier to take these precautions before rigging than it is to discover that pieces of your model are missing or corrupted further down the line (Fig.01).

Essentially we will be creating a very primitive version of a human skeleton to deform our character model, much like real-world bones affect muscle and skin. The purpose of this skeleton will be to pose your character and render it off for your online or printed portfolio. Character rigging can be a very complicated discipline and many games have systems in place specifically for their needs or to meet engine requirements. So to just give an example, we will create a quick rig using the basic bone objects.

Fig 01



Fig 02

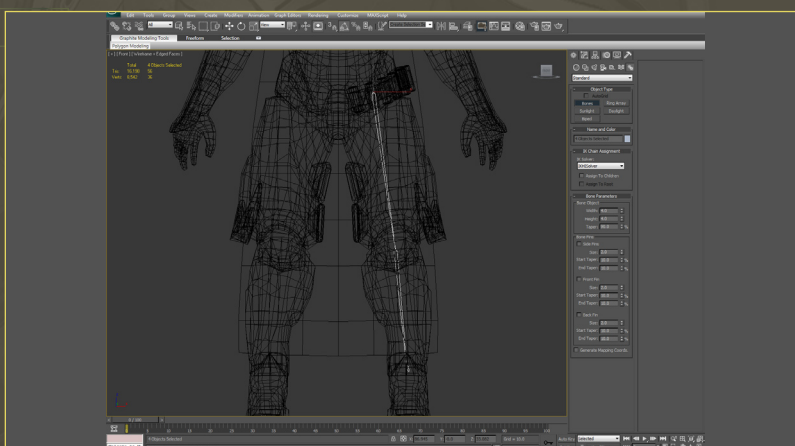


Fig 03

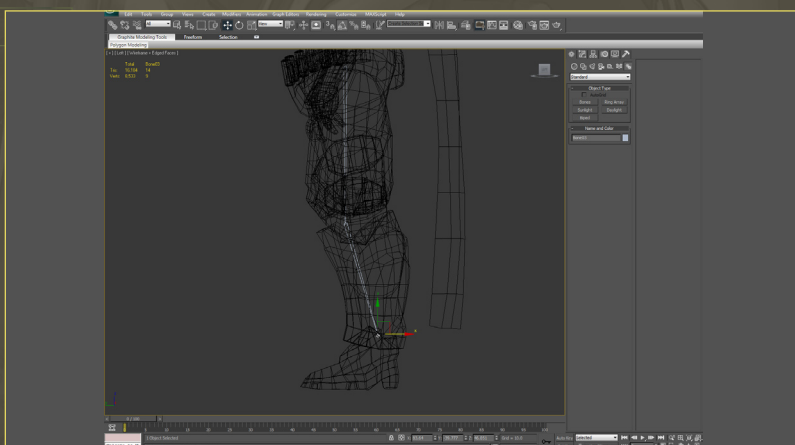
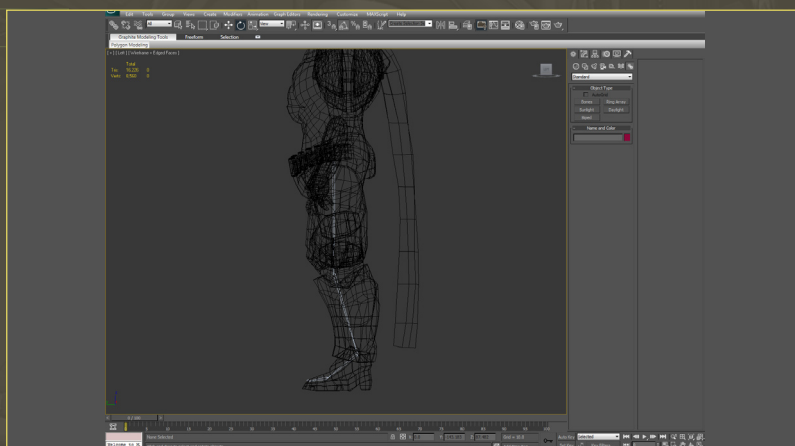


Fig 04



Enter an orthographic view like the front or to the side to do the majority of your rigging. I find that working in perspective views can lead to a lot of errors like bones being drawn in the distance and having incorrect rotations.

In Max, navigate to the Systems tab and select bones. From here, in the front view, click where you would like the chain of bones to be and click where you would like the first bone to end, repeating the process until you get to the ankle. As you can see, you can then select bones and adjust their width or tapering effects (or, alternatively, enter these settings beforehand) (**Fig.02**).

Throughout the character we will basically be creating multiple chains with an effector at the end of each chain to control the movement. In a more complex rig, we could have controllers assigned to these locations for better visibility and constraint handling. For this example however, we will just creating a small bone that will replicate the sockets in limbs like the ankle, wrist and neck.

Moving to the side view, grab the leg effector and give the entire chain a slight bend, as in real life the legs would not be perfectly vertical and doing so could lead to awkward deformations when bending the legs (**Fig.03**).

Next, while still in the side view draw a chain from the leg effector to the toe. This chain will consist of a bone that will control the ankle/heel portion of the foot, as well as a bone for the toes. This chain will also have an effector bone at the end that will control the bending of the foot (**Fig.04**).

Just to make sure, switch to a different view – like front or perspective – to make sure the bones you just created are positioned within the mesh properly (**Fig.05**).

After this, move up to the pelvis and draw a chain from the center of the character to the top

Fig 05

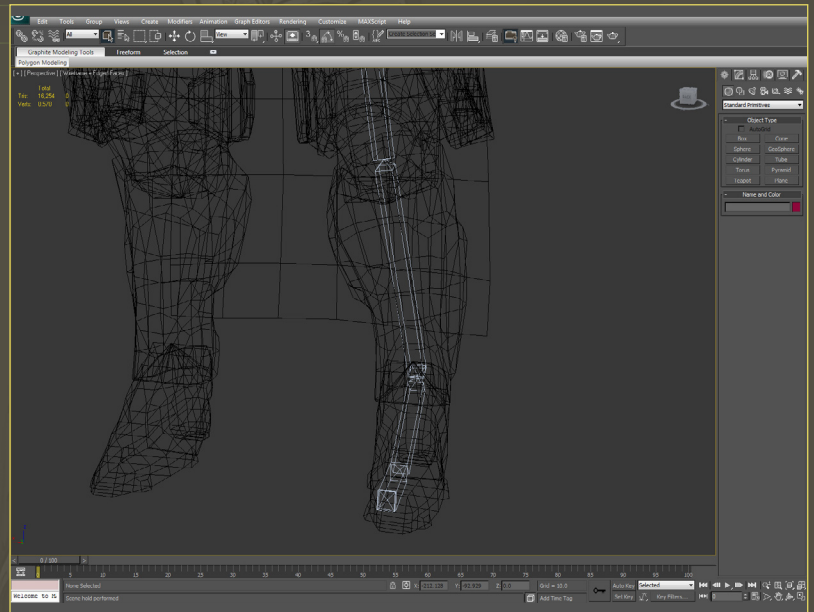


Fig 06

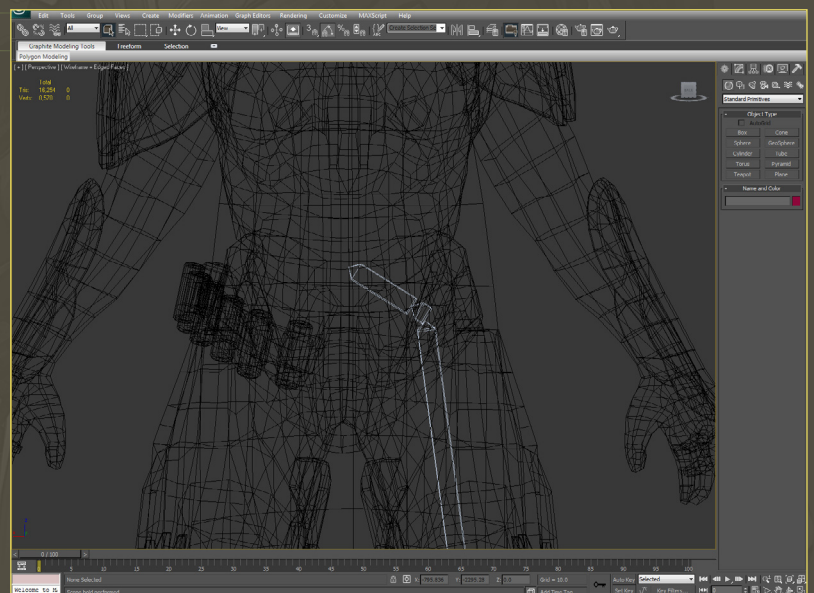
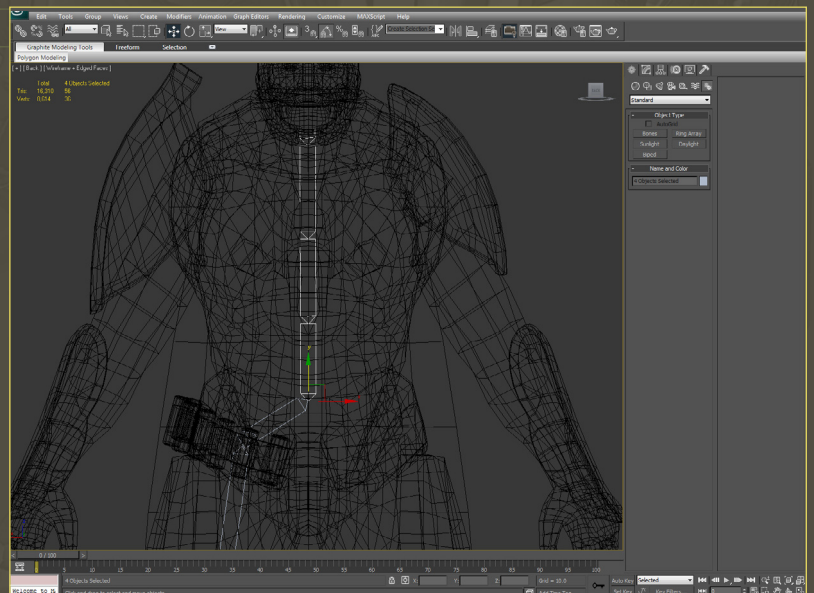


Fig 07





3ds max

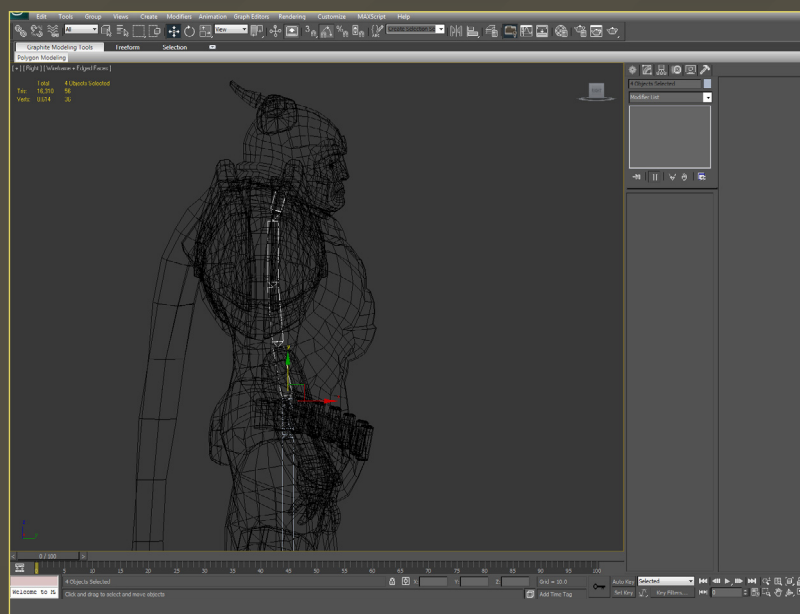


Fig 08

of the leg bone chain. This new chain, which will be half of our character's hips and will consist of a pelvis bone and an effector, will have the ability to control the position of the buttocks and orientation (though limited) of the character's hips (**Fig.06**).

Once the legs and hips have been created, it's time to move on to the spine. Starting at the hips, draw a chain up to the neck through the center of the character. Obviously you won't create a bone for every bone in a real human's spine. I find that three or four spine bones make for good deformations throughout the character's torso (**Fig.07**).

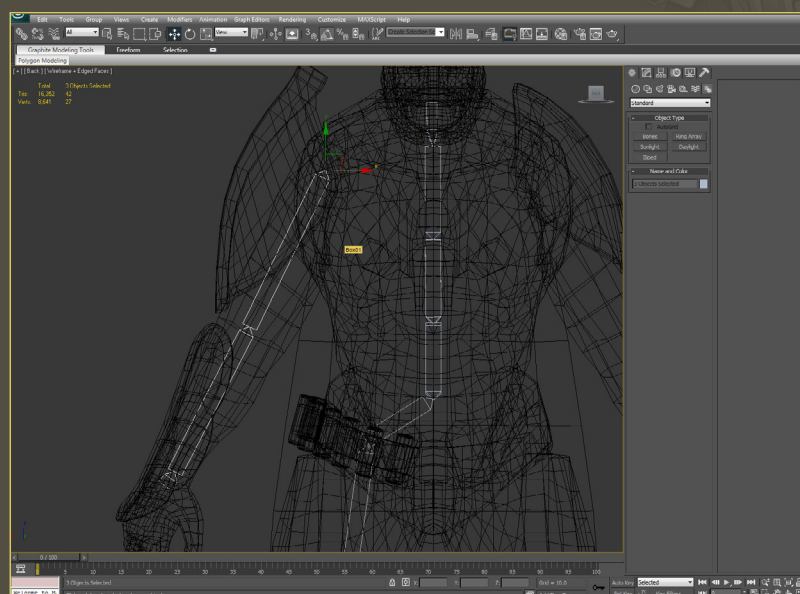


Fig 09

Moving over to the side view, rotate the character's spine to fit the character's (and a human's in general) posture more realistically. The profile of a human generally forms a stretched out S shape, excluding extreme circumstances. Essentially this chain should consist of a bone for every major region of the character's torso, waist, rib cage and shoulders/chest, with an effector in this case for the control of the spine's twist and movement (**Fig.08**).

Move back to the front view and create a bone chain for the arm. Starting at the shoulder socket, create a bone to the elbow and then to the wrist with an effector to control the entire arm's movement. In some cases it is wise to have two bones that create the forearm to replicate the effects of the radius and ulna on the human body. Since this character is mostly hard surfaces with only limited movement we don't need to do this (**Fig.09**).

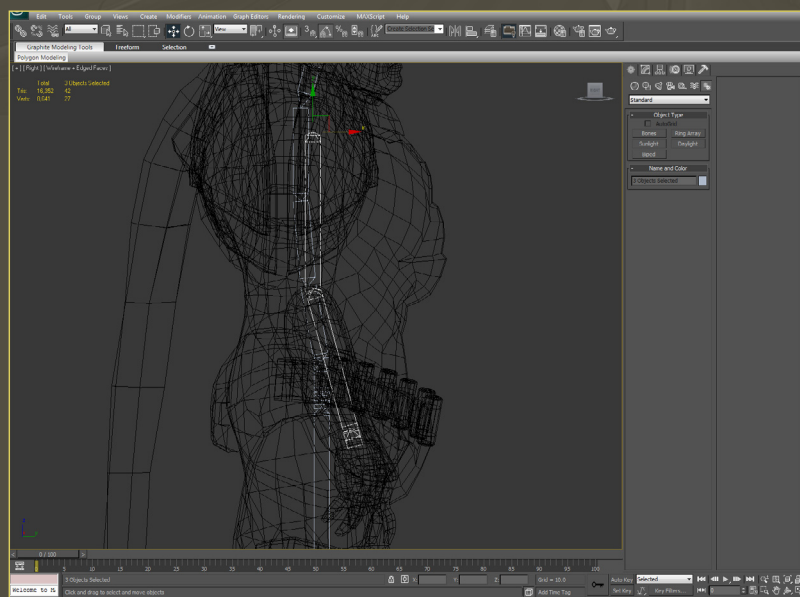
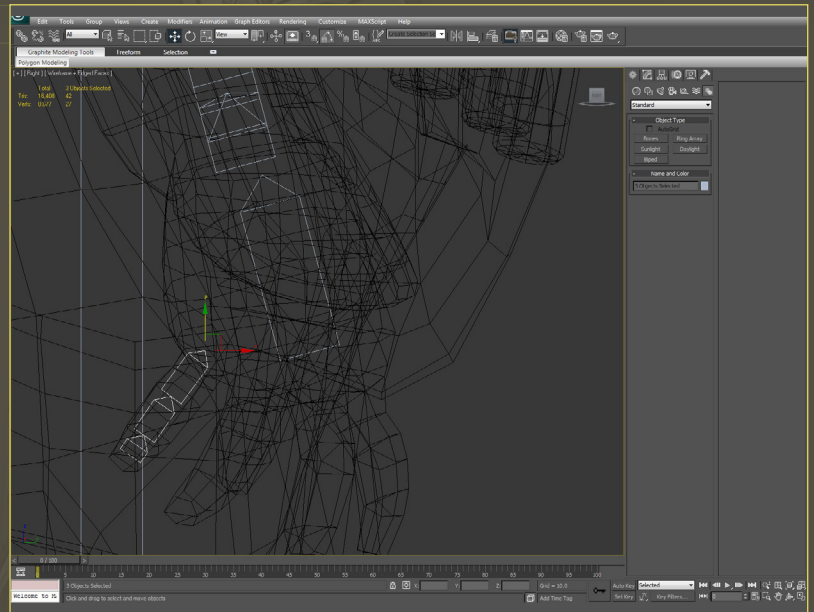


Fig 10

Moving back to side view, give the arm a slight bend to match the character's pose. This will help the character to deform more naturally in the end (**Fig.10**).

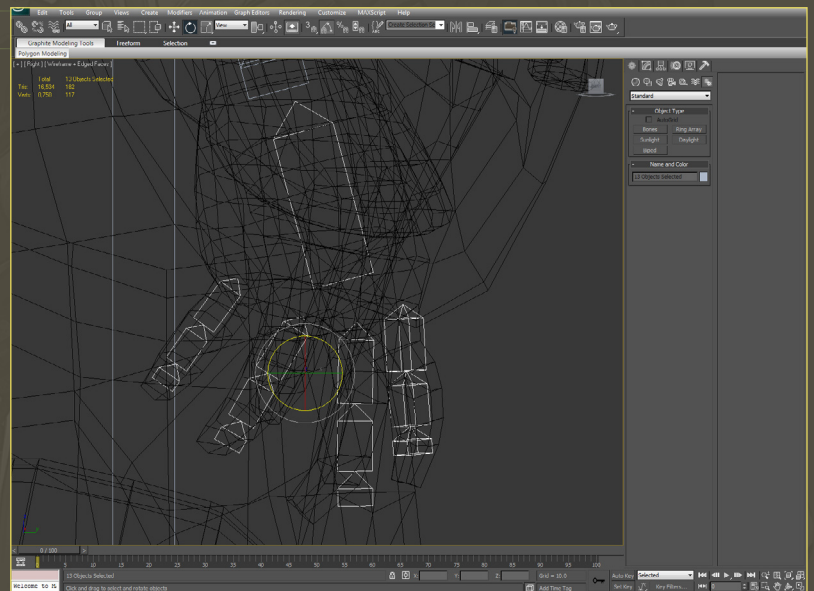
Next begin working on the hand bones. To simplify the area, create one bone to control the deformation of the palm and multiple chains for the fingers. Draw out a single bone for the palm and a three bone chain for one of the fingers. As you can most likely assume, each bone in this chain represents a phalanx bone within the character's digits, with each bone ending approximately where the character's knuckles would be (**Fig.11**).

Fig 11



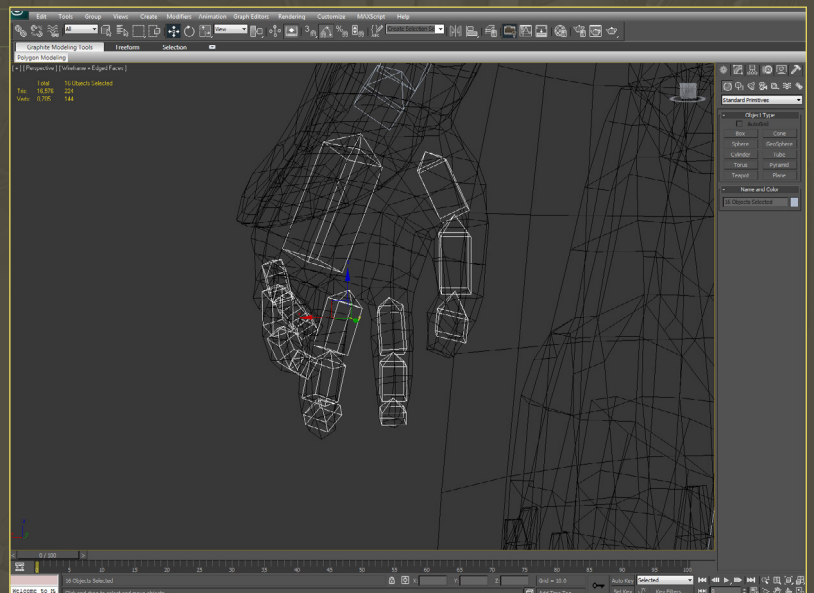
Once one finger bone chain has been created, select the entire chain and duplicate it. This should preserve the bone's hierarchy and loosely position each new chain at every finger and the thumb (**Fig.12**).

Fig 12



Once all of the finger chains have been placed they will need to be adjusted to fit the character more accurately. Since our character model has a slight bend to his fingers, the finger bones will need to be bent to resemble this (**Fig.13**).

Fig 13





3ds max

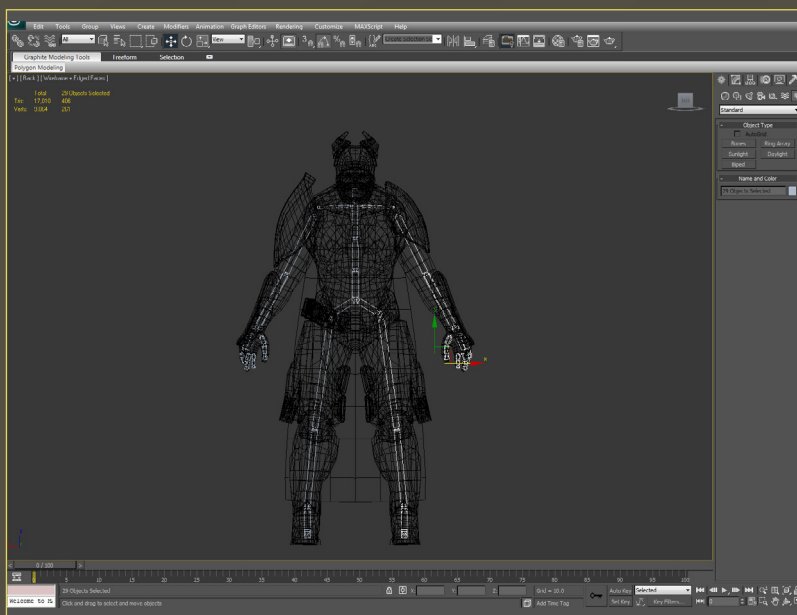


Fig 14

After the hand bones have been placed, draw a two bone chain from the third spine bone that will make up the clavicle and the effector, which will eventually connect to the arms. Once this is completed you essentially have half of our character rigged. Since the Swordmaster model is predominantly symmetrical, we can grab all of the bones that make up the limbs, hips and clavicle, and mirror them in the front view (Fig.14).

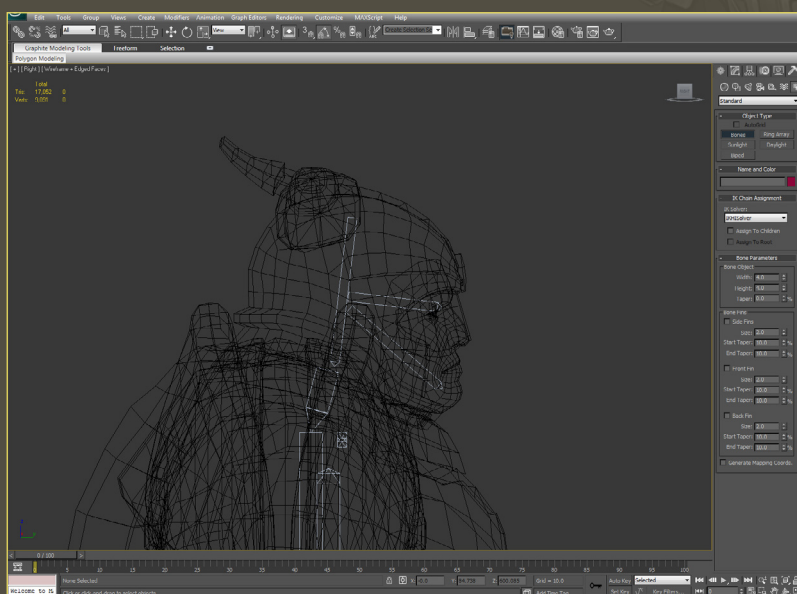


Fig 15

Next, moving on to the side view, create a single bone for the head, the face and the jaw. In this example I will not be rigging the face in depth. For a more complicated rig there would be groups of bones controlling various deformable parts of the face. In this case the entire character head will be controlled by one or two bones, with extra expression just being modeled into the character's face by way of pushing and pulling vertices (Fig.15).

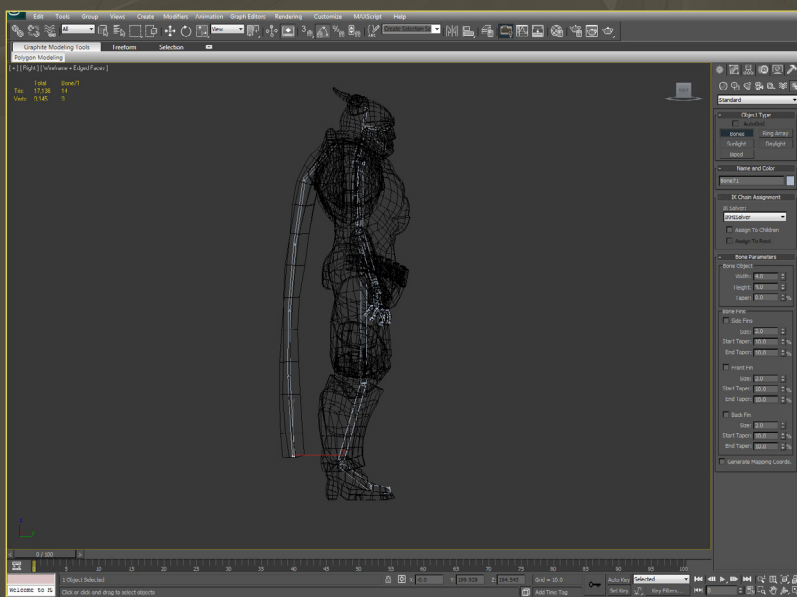


Fig 16

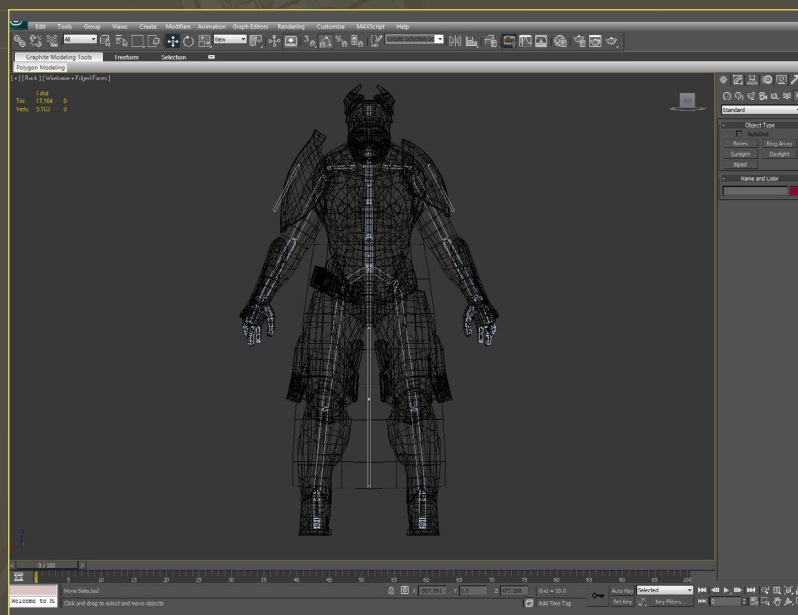
After this create a bone chain running from the shoulder area to the tip of the cape, which will control the deformation of that piece of fabric. For smoother deformations here add more bones than the character's spine. Depending on the importance and budget, some games will have multiple spines controlling the cape, morph targets to control billowing and even real-time cloth simulation.

All we really need, at least for portfolio renders, is some slight deformation to get the starch out of the fabric (Fig.16).

Finally add a single bone floating just above the upper arm bone to control the shoulder pads.

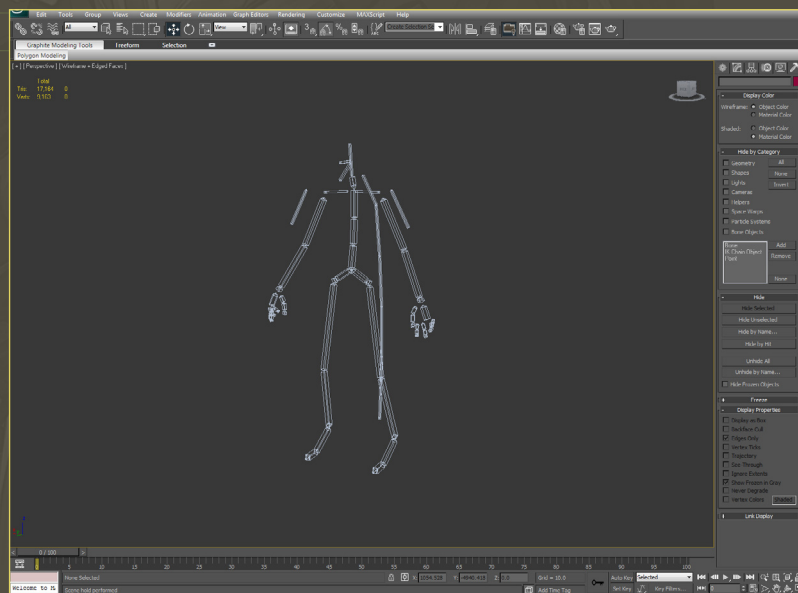
Since these objects are completely solid I think it will be easier to have just one bone control them and nothing else, but have them follow the upper arm bone during movement (**Fig.17**).

Fig 17



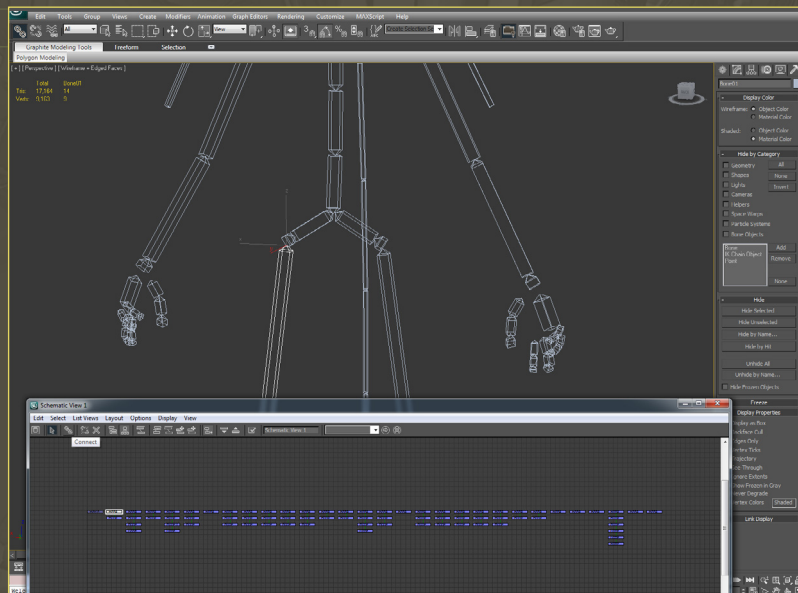
After hiding the character you will be able to see your character's skeleton in all of its glory. This is a good opportunity to check and make sure that you haven't missed anything before moving on to parenting and weighting (**Fig.18**).

Fig 18



Opening up the schematic view you can see that all of our chains and floating bones are listed separately. Much like a flow chart, a chain of bones is indicated by boxes being attached with arrows, the last bone being the final bone in the chain and the first bone being the root of the chain. Selecting a limb will help give a clearer vision of how the schematic is laid out (**Fig.19**).

Fig 19



For my characters, everything basically stems from the pelvis, meaning that the pelvis is the center of gravity for my character.



3ds max

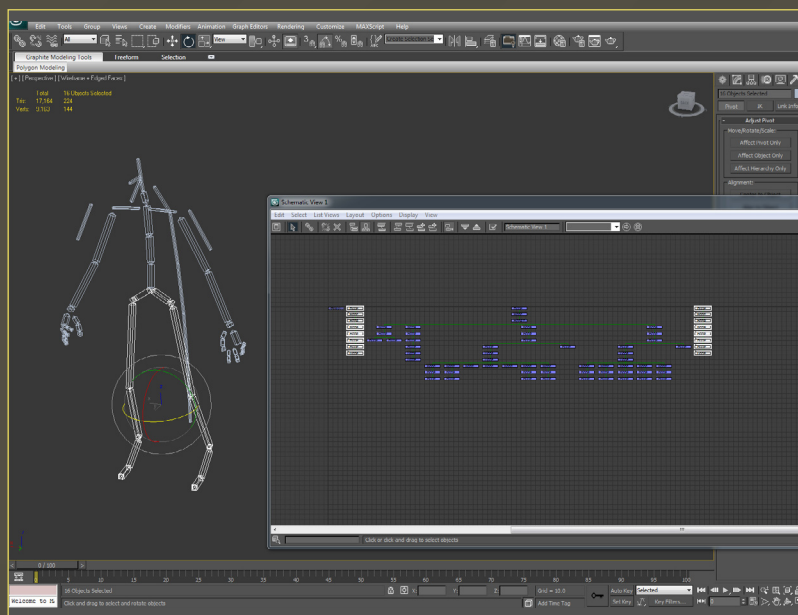


Fig 20

Using the Linking tool (the chain icon in the top left of the screen and the schematic view window), first select children bones and then link them to parents. So, working our way from the pelvis, the root of the right leg bone would be a child of the hip effector and the root of the foot bone would be a child of the leg effector at the ankle. When all of this is linked it means that we should be able to grab the leg effector and move it around with the foot following in place, as well as being able to grab the hip effector and move the entire leg as a whole (Fig.20).

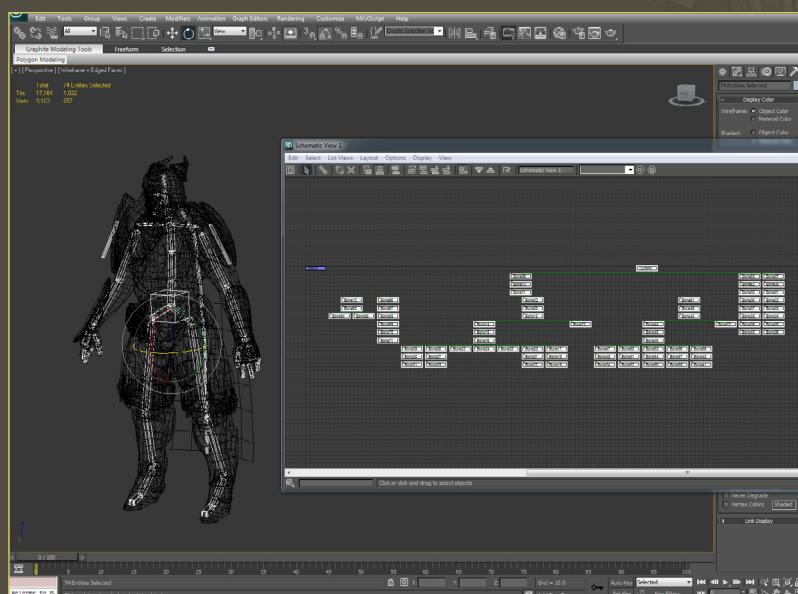


Fig 21

Moving on, parent all of the fingers to the palm, the palm to the arm effector, the arm to the clavicle effector and the clavicle root to the spine effector. Also parent the shoulder pad bones to the upper arm bones and the head bone to the spine effector.

To finish off the rig create a dummy object, which can be another bone or an implicit object. This is essentially going to be culled out as no geometry will be weighted to it and, in some cases, will be ignored during an import to a game engine. Parent the root of the spine and the roots of both hip bones to this dummy object. So now you should be able to grab this object, move it around, and have your entire character follow suit (Fig.21).

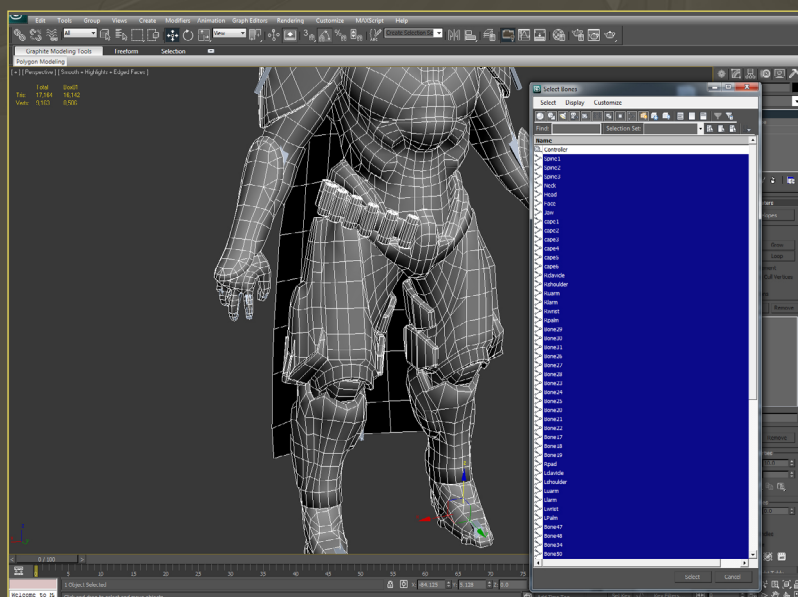


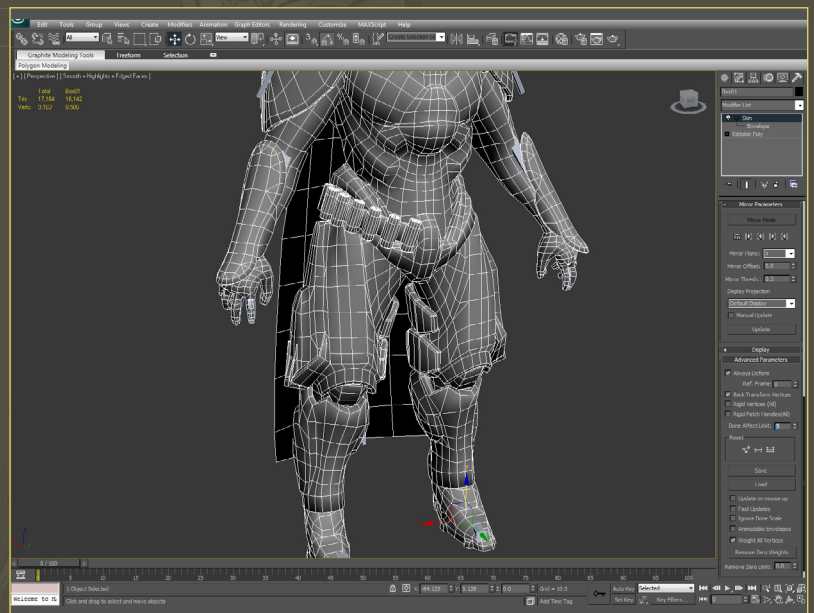
Fig 22

Now it is time to bind the character mesh to the skeleton that we have created. At this stage it may be wise to rename your bones so that they are easier to recognize as Bone32 can be confusing. Also to make weighting easier you could split off parts of the model that will have no influence over the rest of the character, like the shoulder pads and the cape. These pieces will essentially be free-standing elements and because of the constraints we have set up, will already follow the character skeleton as a whole.

Apply a skin modifier in the Bones panel and select the bones that you would like to influence your character (Fig.22).

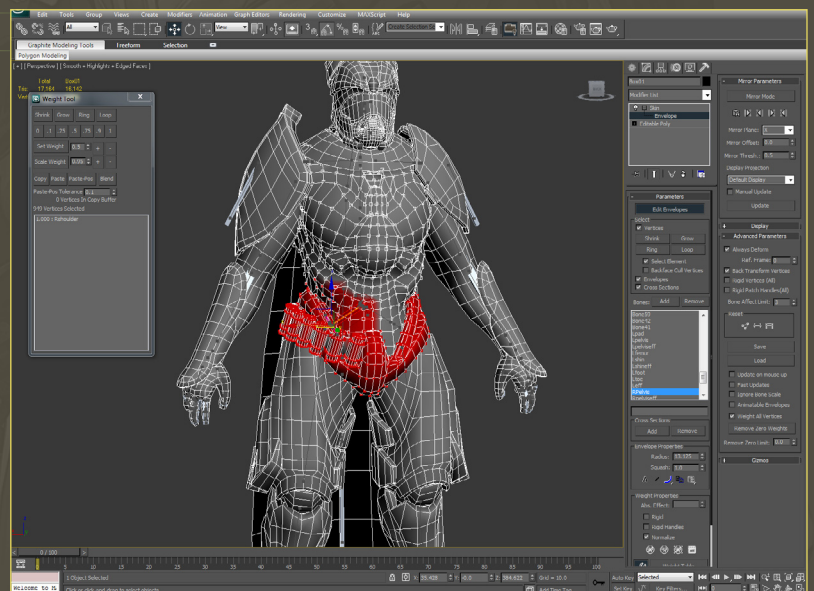
Navigate to Advanced Parameters > Bone Affect Limit and reduce the number of bones from 20 (the default) to something more reasonable like 3 or 4. This means that three bones can influence a vertex at one time. Some consoles and engines will only allow a certain amount of bones to control a vertex, so it is good practice to keep this number as low as possible. Also, the more bones that can influence an area of the model can mean more minor adjustments and sometimes it is better to have a more crisp transition between one bone's influence to the other, like in the case of a forearm crashing into a bicep during deformations rather than having it bend smoothly (**Fig.23**).

Fig 23



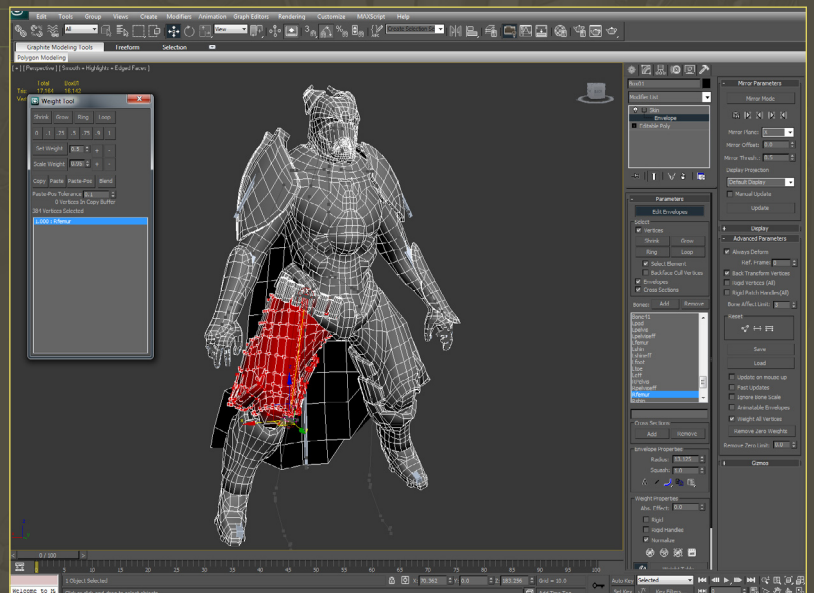
To begin weighting, go through the character and rigidly weight areas to the bone it is closest to. Then move outwards and blend the influences from bone to bone. For the most part (as mentioned earlier) our character is fairly hard surfaced, with a limited range of movement that is more or less isolated to joints and the character's midsection. That being the case, it will be acceptable to have some elements being fully weighted to just one bone with no influence from others, such as the shin armor.

Fig 24



To edit the bone influences on your mesh, open up the Weight tool by clicking on the wrench icon. From here skinning is easy. Select the vertices you would like to edit (while in the Skin modifier), select which bone you would like to have influence them from the list and then enter a value. The Weight tool has quick buttons that allow you to add influence in quarters (which I usually stick to), but you can manually enter values as well (**Fig.24**).

Fig 25



As mentioned above, a lot of the areas of our character can be rigidly weighted. For example, the upper leg armor of my character is fully weighted to the upper leg bone. For a smoother transition grab the vertices near the character's crotch and add influence from the hip bone and hip effector. The knee area is blended between the upper leg and lower leg bones. The lower



3ds max

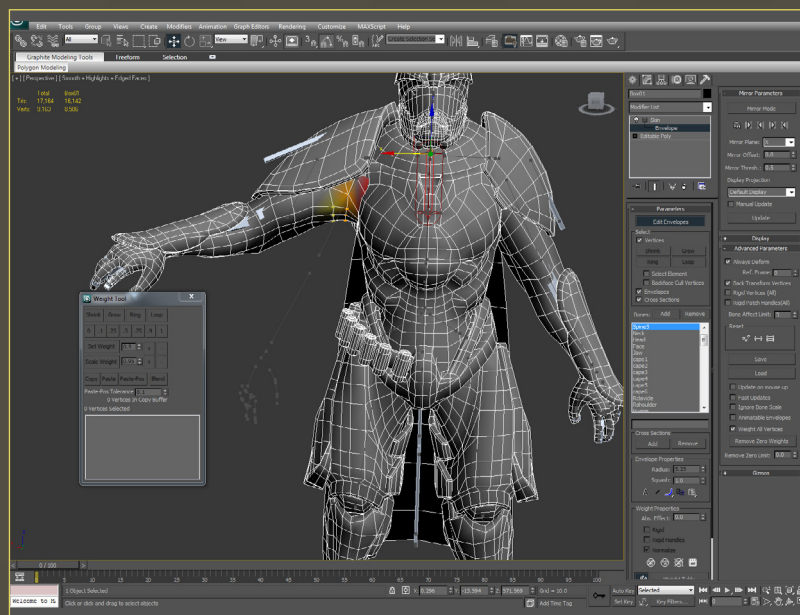


Fig 26

leg is full weighted to the lower leg bone and the character's boot is blended between the heel and toe bones (Fig.25).

Tackle weighting the character's torso by rigidly weighting chunks to the closest spine bone. The majority of the torso armor is devoted to the third spine bone with the softer midsection being a blend between the first and second spine bones. The head and helmet are completely weighted to the head bone with mild influence from the neck and jaw bone for the more organic parts.

As mentioned earlier, the shoulder pads are fully weighted to the upper arm bones with the forearm armor being fully weighted to the forearm bone. For the softer, more organic parts, like the wrist and shoulders, blend to the adjacent bone. The upper arm, for example, will blend into the clavicle and top spine bone (Fig.26).

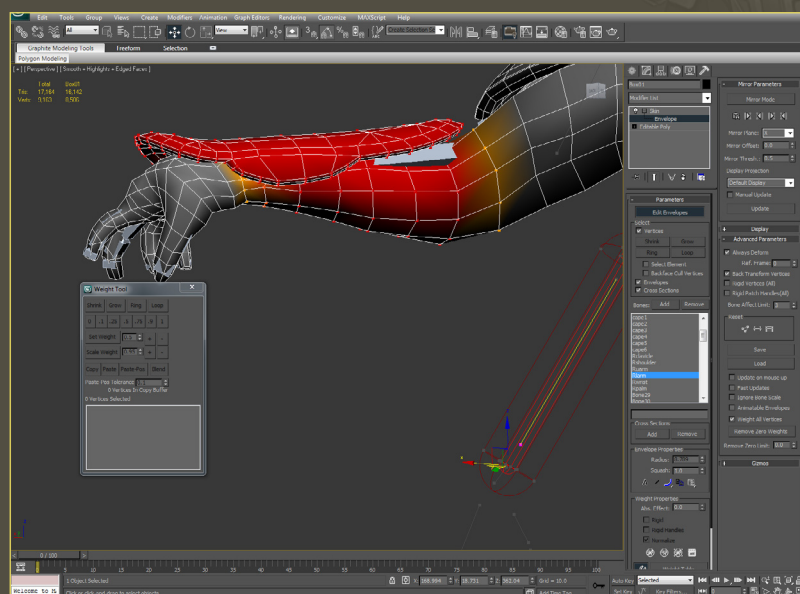


Fig 27

Moving down the arm, our character's wrist and elbow has a fairly even blend between the palm bone and upper arm bone. The character's fingers follow the closest bone fairly rigidly with blending at the knuckles (Fig.27).

Finally pose your character. I find that by creating a few different poses you can test the limits of our weighting, which inevitably leads to tweaking the weights as needed to have the character looking its best in the particular pose.



Fig 28

For portfolio presentation it's a good idea to play it fairly safe for your character's pose and deliver a neutral shot. This will help avoid any awkward deformations that could mislead the viewer into thinking something is wrong with your actual model. For this example, I've dropped the arms, relaxed the legs a bit, made the cape not so uniform and twisted the spine and head to have the character looking at the camera (Fig.28).

After a few more tweaks, like adjusting the finger rotations and curl, pointing the toes to be more natural and removing the visor to show the character's face, you can bring in the Swordmaster's weapons for the final image (Fig.29).

For the final presentation I suggest using the Marmoset Toolbag (<http://www.8monkeylabs.com/toolbag>). I like to use the Toolbag as a quick model viewer and rendering solution due to its ease of use and focus on creating images for artistic presentation rather than full integration into a game engine. Many different features are available for post-processing effects and exporting a print-ready image is as easy as pressing one button. It also accepts OBJ files and many different image formats without the need for a complex shader setup. For the most part, this tool just allows you to jump in and have a professional quality rendered image within a few minutes. Of course, you can also use the Xoliul viewport shader covered in a previous chapter as an alternative.

The Toolbag allows you to create multiple materials for your character using the same textures. Because there are a few different physical materials within the Swordmaster character, split off pieces of the model to reflect this. These pieces are: the face and eyes (which will use a skin shader), the character body (which will use a standard phong material) and the weapons, which are a different texture set altogether.

Export all of the models together as one OBJ file. The different pieces will be recognized as chunks in the Toolbag (Fig.30).

Open up the Marmoset Toolbag and navigate to the File tab. Here you can open up a new mesh or, if you have a scene previously created, open that scene. Click on the Open Mesh button and select the Swordmaster model you just exported from Max (Fig.31).

Fig 29



Fig 30



Fig 31





3ds max



Fig 32

The Toolbag applies a default material automatically on all of the models that are imported. So unlike other applications, material IDs and materials applied to the model during export have no effect. Creating materials is quick and easy and will basically be creating a duplicate of the default material that you can then modify and save as your own. Simply click on New Mat... and set the name of the file and where you would like the materials to be saved. If you click on Save Mesh & Materials at any time it will save both your model and materials and the material application to those models. To apply a material to your model, select the model (which will become outlined in white briefly) in the menu with a material selected and click Apply Selected Material. Once a material is active, it will be opened and closed by parenthesis.



Fig 33

I created three different materials, as noted before, for the face, armor and weapons (Fig.32).

Next, in the dropdown Channel Model menu, there are multiple types of materials you can choose from. As mentioned before, I am going to choose a phong material for the character's armor and weapons. This enables different texture slots including the usual Diffuse, Normal and Spec, as well as some other options such as emissive, which we will use for our glowing orange lights. Click on the name of the texture type and navigate to your texture map to load it into the Toolbag. C allows you to clear the field, R allows you to reload the texture and P brings up a map preview.



Fig 34

To see the single sided cape, disable Backface Culling. For all of the materials in this example you will also want to enable Cast Shadows (Fig.33).

Next enter the textures for the Swordmaster's skin material and change the shader type to SkinEnvironment (Fig.34).

Looking further down the list, you will notice that there are also different parameters that can be altered. In this case, I increased the specular power after enabling it and changed the color to a lighter blue. This helps sell the polished steel look (**Fig.35**).

Navigation is fairly straightforward in the Toolbag. Hold down Shift and use the mouse buttons to change the orientation of the sky, which will function as the scene's dominant light source. Hold down Alt and use the mouse buttons to move the camera and Ctrl with mouse buttons to move your model.

An important thing to note is that your Normal maps may be displayed inverted in the Toolbag viewport, depending on the settings you entered during texture baking. To fix this problem, navigate to the View tab and click the Invert Y radio button, which will essentially invert the green channel. To see this change, you will need to click Apply (**Fig.36**).

Fig 35

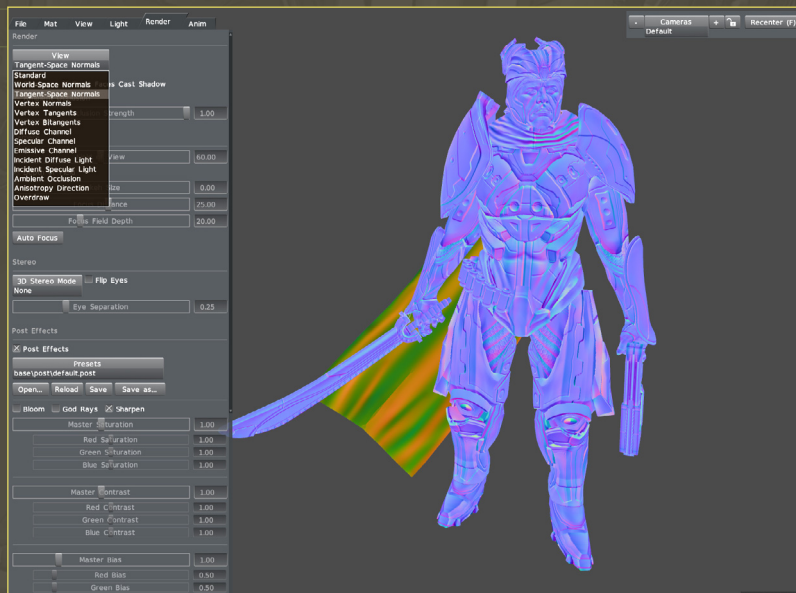


Fig 36



Switching over to the Render tab, you will notice that there are many different options for view modes. This can come in handy if you want to show your posed character with only one type of texture applied as a material breakdown to viewers. For example, it can be nice to show just the Diffuse, Normal and Specular maps separately and then the final composite (**Fig.37**).

Fig 37





3ds max

SWORDMASTER 2 Chapter 6: Rendering

3dcreative



Fig 38

Scrolling further down the list in the Render section you can enable and adjust post-processing effects. Generally, these are things such as Bloom or Sharpening. You can also adjust the brightness, contrast and color balance for your final image. The Toolbag has many different presets to choose from ranging anywhere from your cliché brown, bloom-heavy Next Gen setting to less conventional, cinematic effects like Polaroid and Married to the Sea. You can play with these settings or create your own by adjusting the default settings. These post-processing effects can also be saved and loaded for other projects (**Fig.38**).



Fig 39

Select the Next Gen preset and begin tweaking the settings to better suit your needs. Generally update the sharpness of the image as well as some bloom values (**Fig.39**).

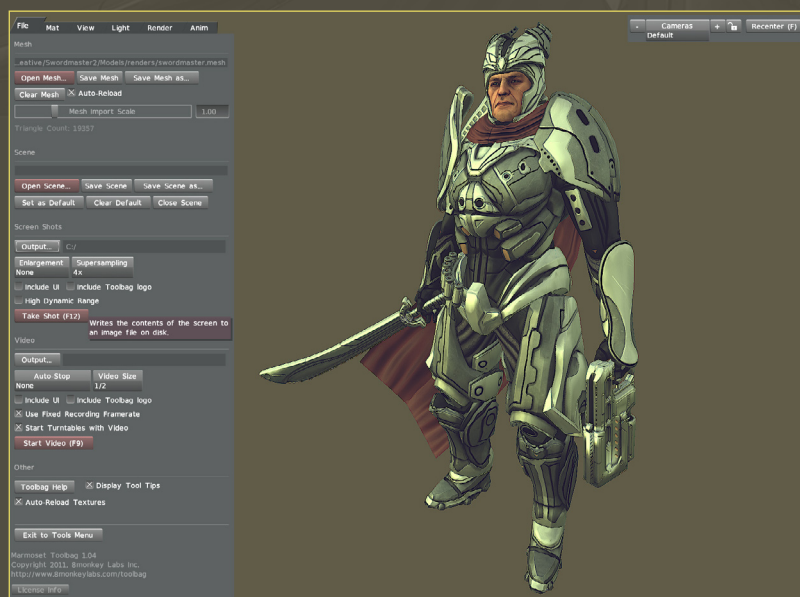


Fig 40

Finally, to export your image you can simply use print screen or, if you would like a higher resolution image that you can use for print or further alterations, navigate to the File tab again. Here you have the ability to adjust the image size by increasing the Enlargement value. Next, set your output folder and hit F12 to export an image. As a warning, depending on how strong your machine is, this function can fail if the image size is too large. So be sure to save your scene first (**Fig.40**).

Opening the screenshot you exported from the Toolbag in Photoshop, you can add color balancing layers for final tweaks to get your image exactly how you would like it. There really is no hard and fast rule here as every image can use different settings. Just feel free to play around with different adjustments until you are satisfied. I find that using the alpha channel exported with the image as a mask and applying Curves or Color Balance adjustment layers to pop out the highlights and shadows of the image really helps (**Fig.41**).

Fig 41



This is a perfectly fine place to stop! You have a great character with a presentation that shows the technical qualities of the model in a professional way with real-time rendering solutions. You can, however, move forward and create a beauty shot of your character as an addition that can use more external effects and a stronger action pose. I have created an action pose that has the Swordmaster character sailing into battle while firing off a few rounds at his opponent (**Fig.42**).

Fig 42



Here you can see the model using the same materials we had set up previously, with a different post-processing effect that pushes out the colder values in the image (**Fig.43**).

Fig 43





I applied a red color wash in the post-processing settings, altered the depth of field settings to focus on the center of the character and slightly blurred out objects further away (bullets, tips of the cape, the right foot, etc.). I also applied a vignette effect, which shades out the far corners of the image (**Fig.44**).



You can also play around with different lighting effects. For my dominant light source, which is based on the sky setting, I chose Sunlight. By enabling Show Skybox this sky image will become visible. You can also add point lights, which I used as accents by clicking Add Light under the Dynamic Lights section. Once you create a light, you can alter its brightness and color as well as its position in the scene, which can be adjusted by interacting with the gizmo that appears over the light when its name is selected in the lights list (**Fig.45**).

Again I exported a screen shot (at 4x resolution which is big enough for magazine prints). Bring this into Photoshop and add a gradient near the bottom of the image to help ground the character and adjust the color balance just a touch (**Fig.46**).



Here is where I cheated a little and added a few minor effects like boosting up the glow of the armor lights and smoke to the gun. Once I was happy with everything, I added some descriptive text and saved off the image and it was done!

GAVIN GOULDEN

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SWORDMASTER²

SWORDMASTER 2



CHAPTER 6 – RENDERING

In 2006 3DTotal created some groundbreaking training that quickly made a name for itself as one of the best 3D training resources available; that series was called the Swordmaster! Well five years later the Swordmaster is back and better than ever. In this series industry professional Gavin Goulden will be talking you through how to take a concept and turn it into a top quality character ready for use in a game. From basic modeling through to sculpting and texturing, Gavin will cover every step in great detail so that even an inexperienced 3D artist will be able to comfortably follow this series.

CHAPTER 1 | OCTOBER ISSUE 074
Base model

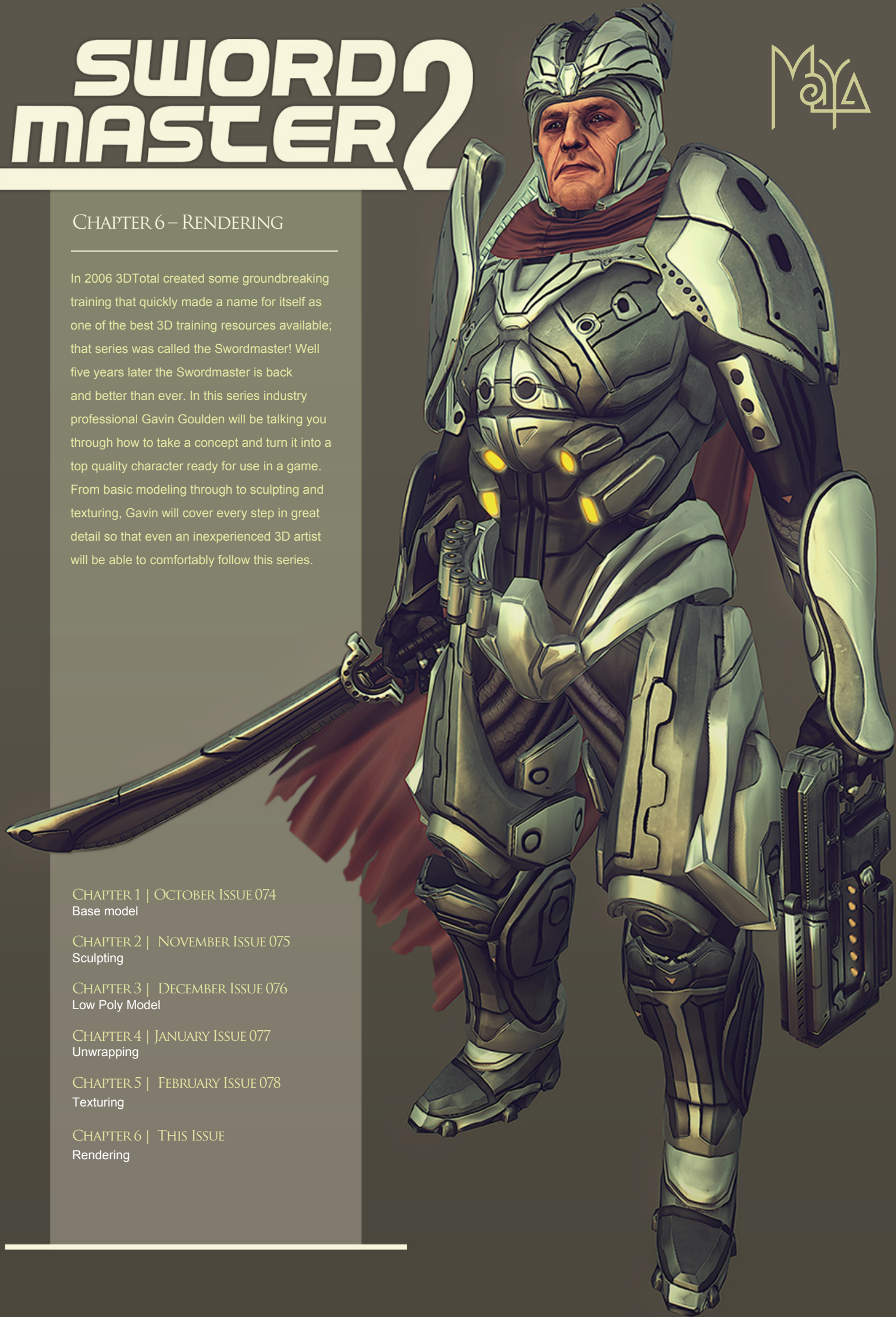
CHAPTER 2 | NOVEMBER ISSUE 075
Sculpting

CHAPTER 3 | DECEMBER ISSUE 076
Low Poly Model

CHAPTER 4 | JANUARY ISSUE 077
Unwrapping

CHAPTER 5 | FEBRUARY ISSUE 078
Texturing

CHAPTER 6 | THIS ISSUE
Rendering



CHAPTER 6 – RENDERING

Software used: Maya

INTRODUCTION

In this chapter we finish off the Swordmaster 2 series by covering some simple rigging techniques, including how to weight your character model to a skeleton. After this we will look into posing your character in both extreme and neutral action shots, and finally bringing it all together in Marmoset to create a final image for your online portfolio.

Adding a pose to your character can really bring it to life. Dropping the character out of a static bind pose not only looks more “finished” to the viewer, but it can also help sell what type of character it is by displaying emotion and attitude.

To begin, grab a clean version of the final low poly model. This means clearing off any materials that may have been on the character, and double-checking that there are no floating vertices that may cause issues, all of the elements of the model are properly merged together (discovering that a part of the model is not attached to the main element can be a stumble block if left for too long) and that none of the faces are flipped. I even go as far as exporting the model and importing it into a fresh scene. The reason for this is that it is much easier to take these precautions before rigging than it is to discover that pieces of your model are missing or corrupted further down the line (**Fig.01**).

Essentially we will be creating a very primitive version of a human skeleton to deform our character model, much like real-world bones affect muscle and skin. The purpose of this skeleton will be to pose your character and render it off for your online or printed portfolio. Character rigging can be a very complicated discipline and many games have systems in place specifically for their needs or to meet engine requirements. So to just give an example, we will create a quick rig using the basic bone objects.

Fig 01

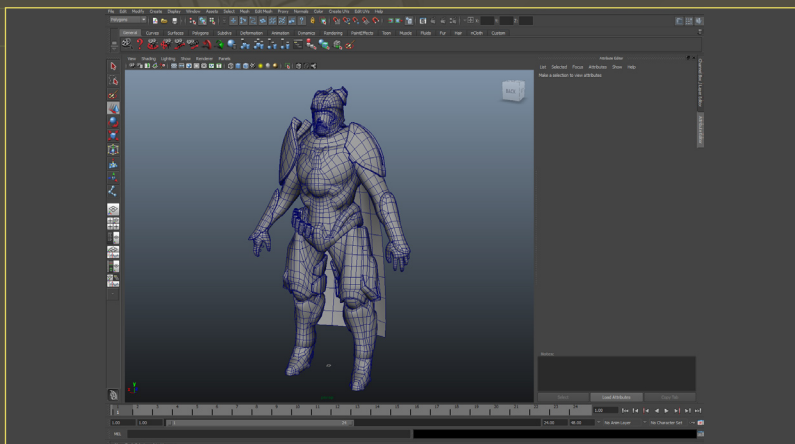


Fig 02

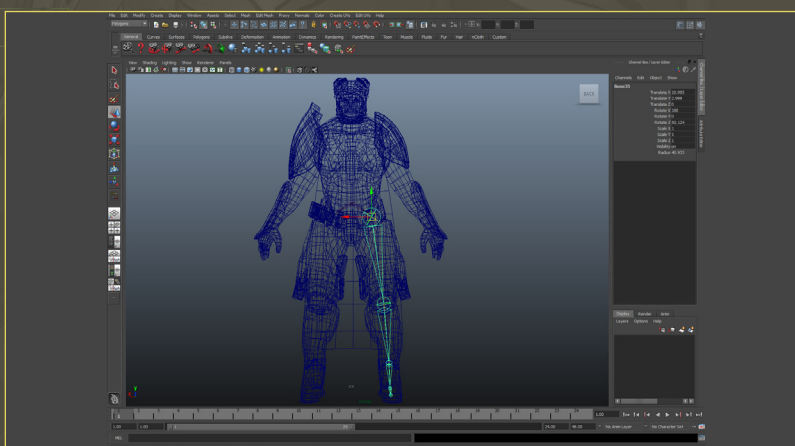


Fig 03

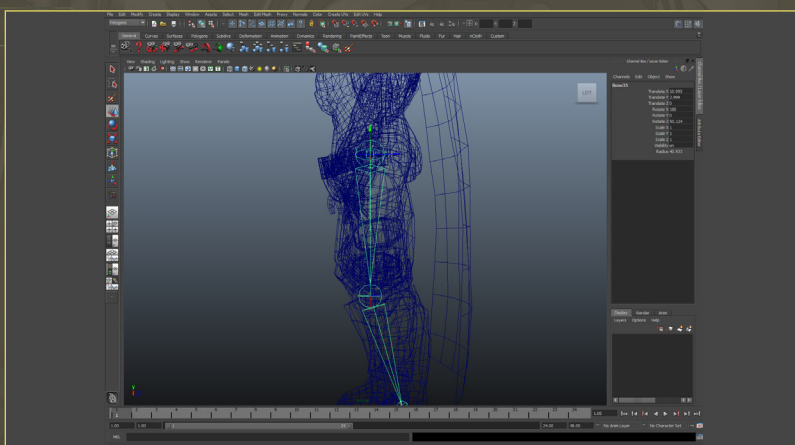
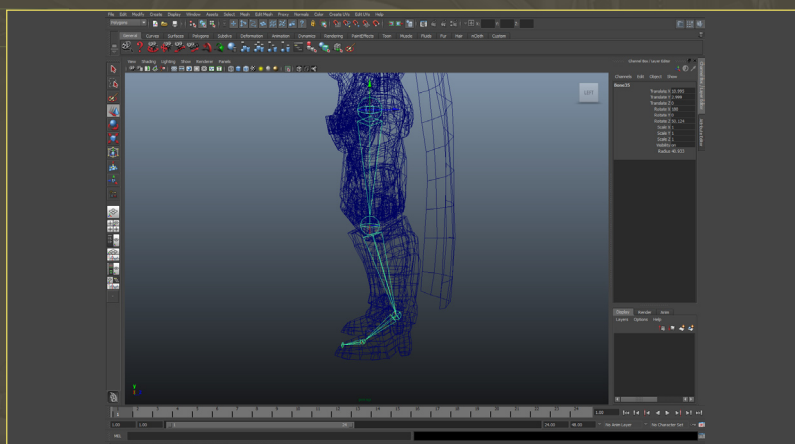


Fig 04



Enter an orthographic view like the front or to the side to do the majority of your rigging. I find that working in perspective views can lead to a lot of errors like bones being drawn in the distance and having incorrect rotations.

In Maya, navigate to Skeleton > Joint Tool in the Animation menu set (**Fig.02**).

Throughout the character we will basically be creating multiple chains with an effector at the end of each chain to control the movement. In a more complex rig, we could have controllers assigned to these locations for better visibility and constraint handling. For this example however, we will just creating a small bone that will replicate the sockets in limbs like the ankle, wrist and neck.

Moving to the side view, grab the leg effector and give the entire chain a slight bend, as in real life the legs would not be perfectly vertical and doing so could lead to awkward deformations when bending the legs (**Fig.03**).

Next, while still in the side view draw a chain from the leg effector to the toe. This chain will consist of a bone that will control the ankle/heel portion of the foot, as well as a bone for the toes. This chain will also have an effector bone at the end that will control the bending of the foot (**Fig.04**).

Just to make sure, switch to a different view – like front or perspective – to make sure the bones you just created are positioned within the mesh properly (**Fig.05**).

After this, move up to the pelvis and draw a chain from the center of the character to the top of the leg bone chain. This new chain, which will be half of our character's hips and will consist of a pelvis bone and an effector, will have the ability to control the position of the buttocks and orientation (though limited) of the character's hips (**Fig.06**).

Fig 05

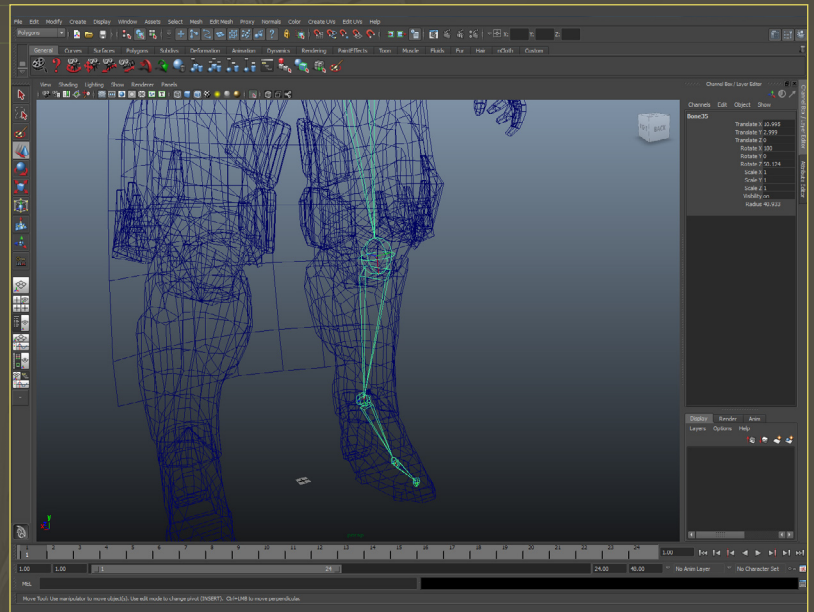


Fig 06

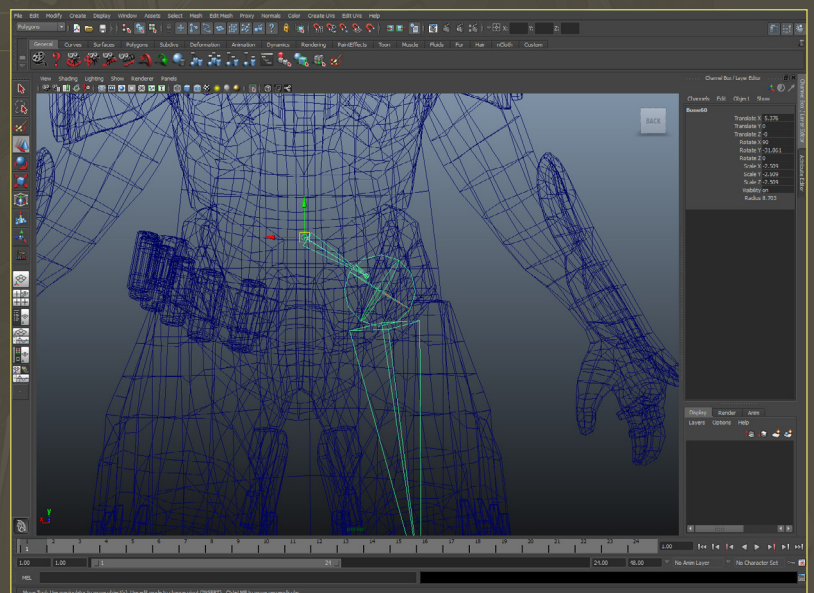
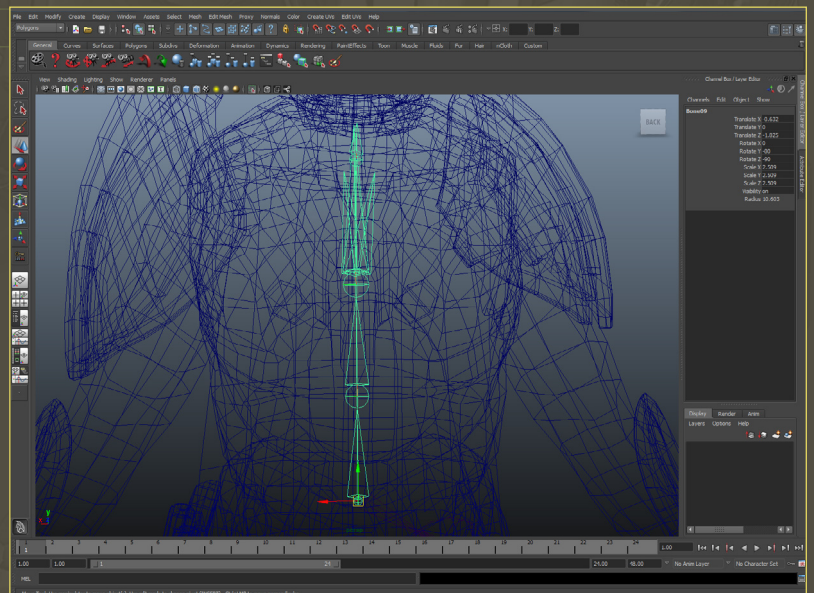


Fig 07



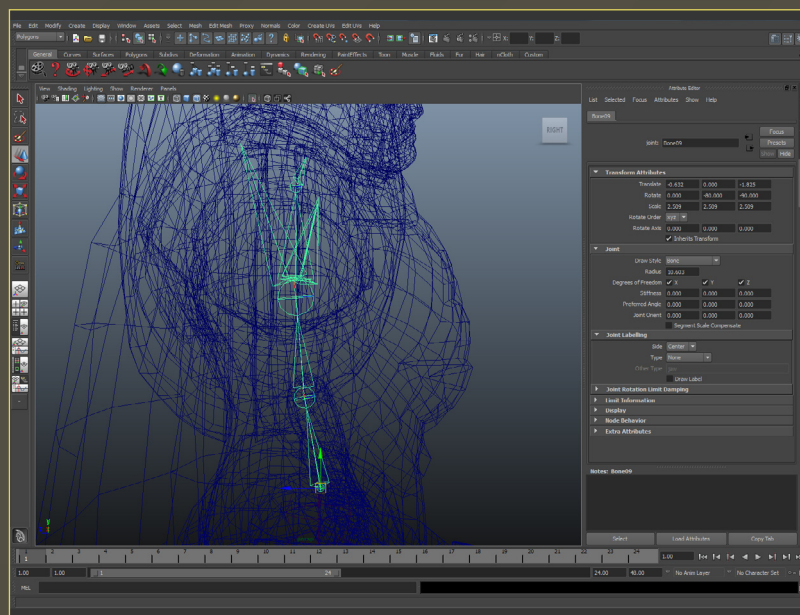


Fig 08

Once the legs and hips have been created, it's time to move on to the spine. Starting at the hips, draw a chain up to the neck through the center of the character. Obviously you won't create a bone for every bone in a real human's spine. I find that three or four spine bones make for good deformations throughout the character's torso (**Fig.07**).

Moving over to the side view, rotate the character's spine to fit the character's (and a human's in general) posture more realistically. The profile of a human generally forms a stretched out S shape, excluding extreme circumstances. Essentially this chain should consist of a bone for every major region of the character's torso, waist, rib cage and shoulders/chest, with an effector in this case for the control of the spine's twist and movement (**Fig.08**).

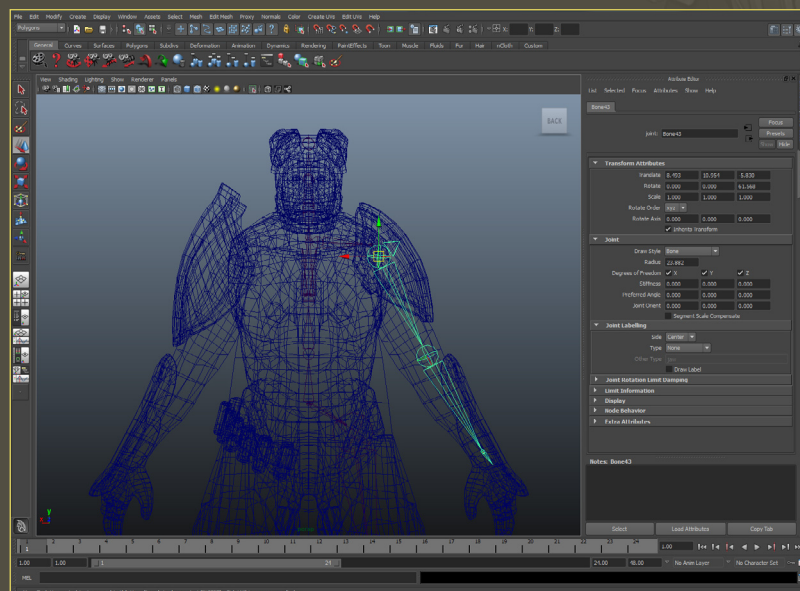


Fig 09

Move back to the front view and create a bone chain for the arm. Starting at the shoulder socket, create a bone to the elbow and then to the wrist with an effector to control the entire arm's movement. In some cases it is wise to have two bones that create the forearm to replicate the effects of the radius and ulna on the human body. Since this character is mostly hard surfaces with only limited movement we don't need to do this (**Fig.09**).

Moving back to side view, give the arm a slight bend to match the character's pose. This will help the character to deform more naturally in the end (**Fig.10**).

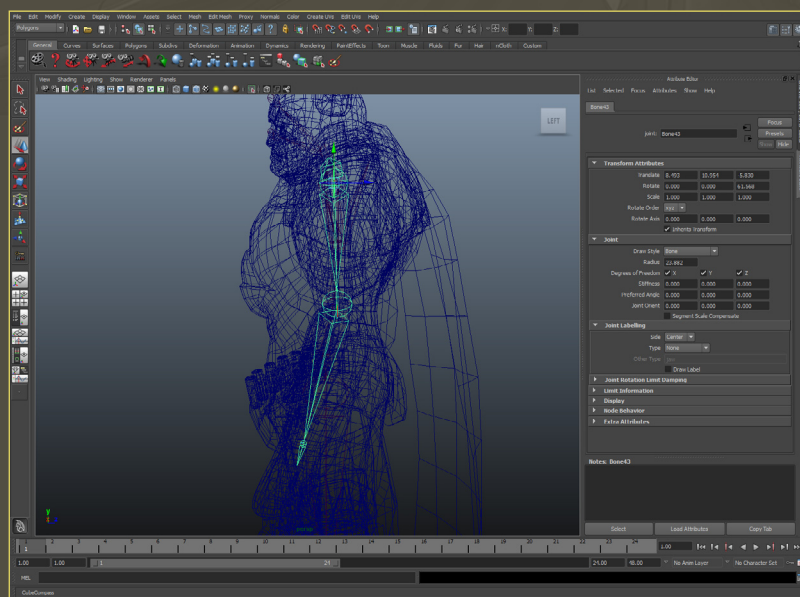
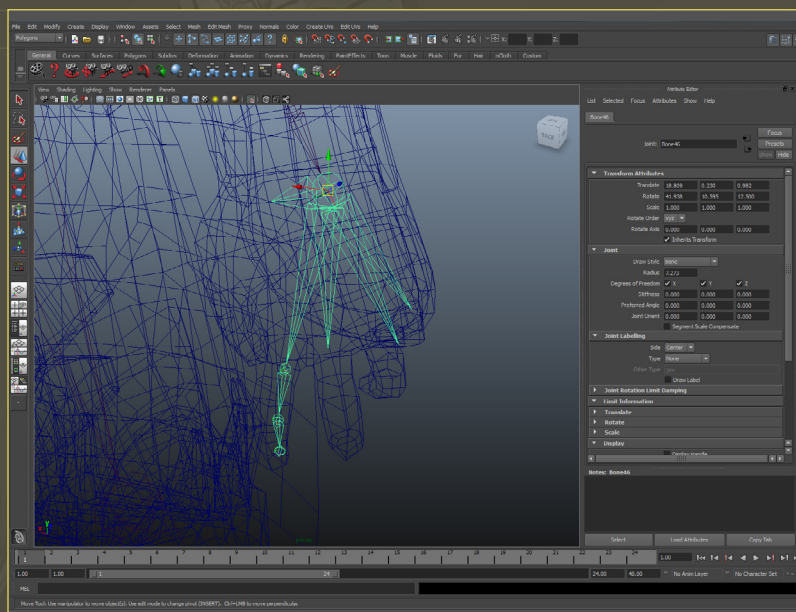


Fig 10

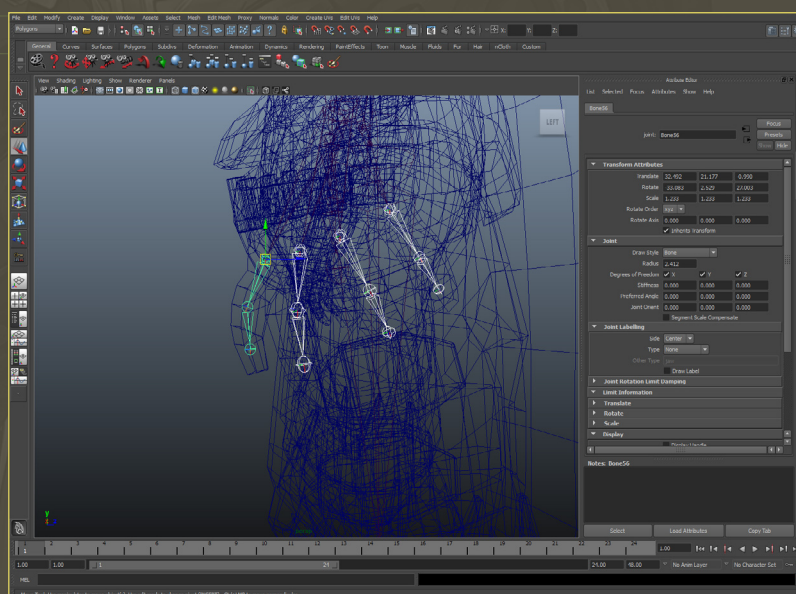
Next begin working on the hand bones. To simplify the area, create one bone to control the deformation of the palm and multiple chains for the fingers. Draw out a single bone for the palm and a three bone chain for one of the fingers. As you can most likely assume, each bone in this chain represents a phalanx bone within the character's digits, with each bone ending approximately where the character's knuckles would be (**Fig.11**).

Fig 11



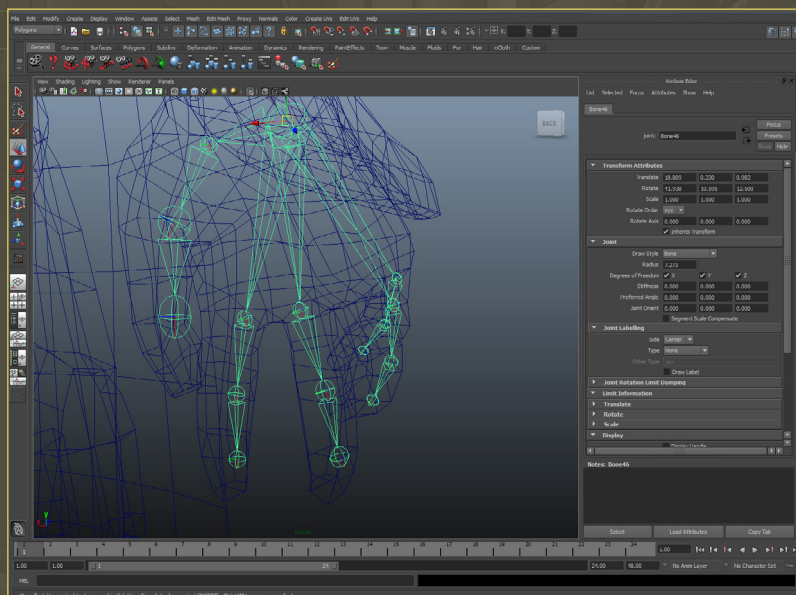
Once one finger bone chain has been created, select the entire chain and duplicate it. This should preserve the bone's hierarchy and loosely position each new chain at every finger and the thumb (**Fig.12**).

Fig 12



Once all of the finger chains have been placed they will need to be adjusted to fit the character more accurately. Since our character model has a slight bend to his fingers, the finger bones will need to be bent to resemble this (**Fig.13**).

Fig 13



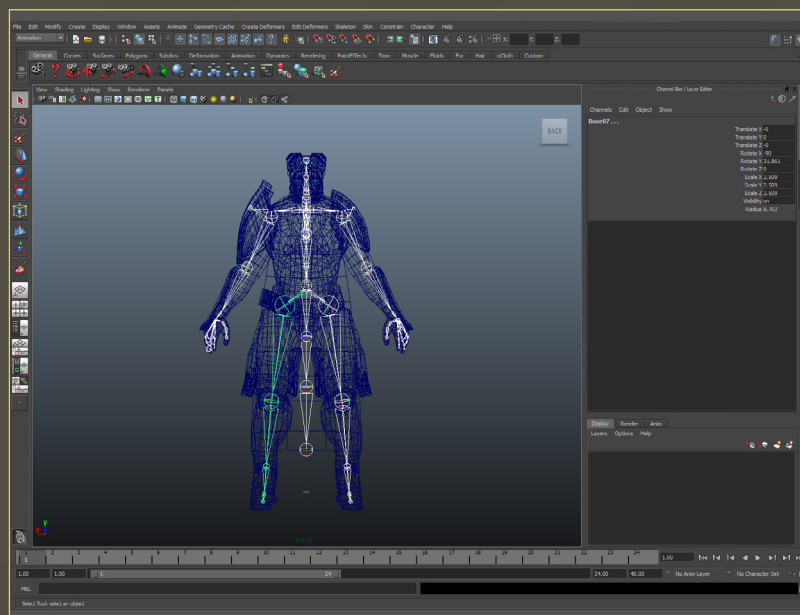


Fig 14

After the hand bones have been placed, draw a two bone chain from the third spine bone that will make up the clavicle and the effector, which will eventually connect to the arms. Once this is completed you essentially have half of our character rigged. Since the Swordmaster model is predominantly symmetrical, we can grab all of the bones that make up the limbs, hips and clavicle, and mirror them in the front view (Fig.14).

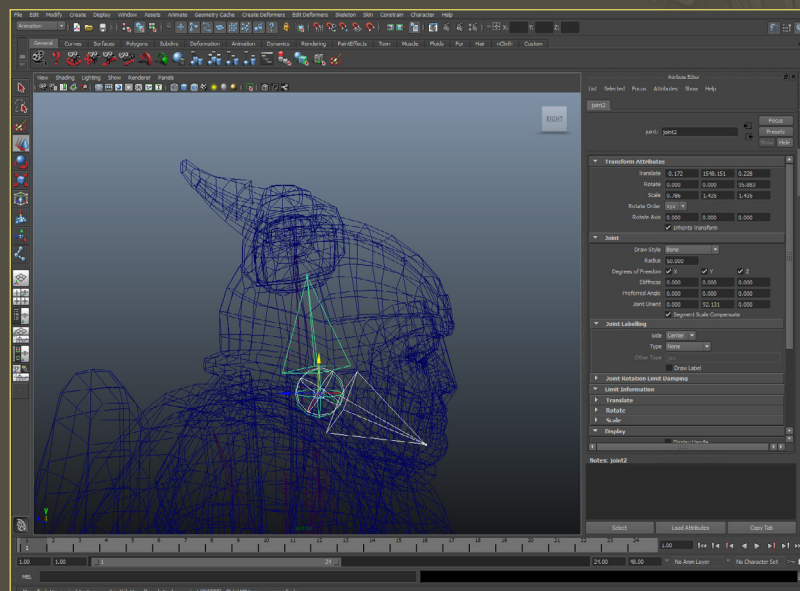


Fig 15

Next, moving on to the side view, create a single bone for the head, the face and the jaw. In this example I will not be rigging the face in depth. For a more complicated rig there would be groups of bones controlling various deformable parts of the face. In this case the entire character head will be controlled by one or two bones, with extra expression just being modeled into the character's face by way of pushing and pulling vertices (Fig.15).

After this create a bone chain running from the shoulder area to the tip of the cape, which will control the deformation of that piece of fabric. For smoother deformations here add more bones than the character's spine. Depending on the importance and budget, some games will have multiple spines controlling the cape, morph targets to control billowing and even real-time cloth simulation.

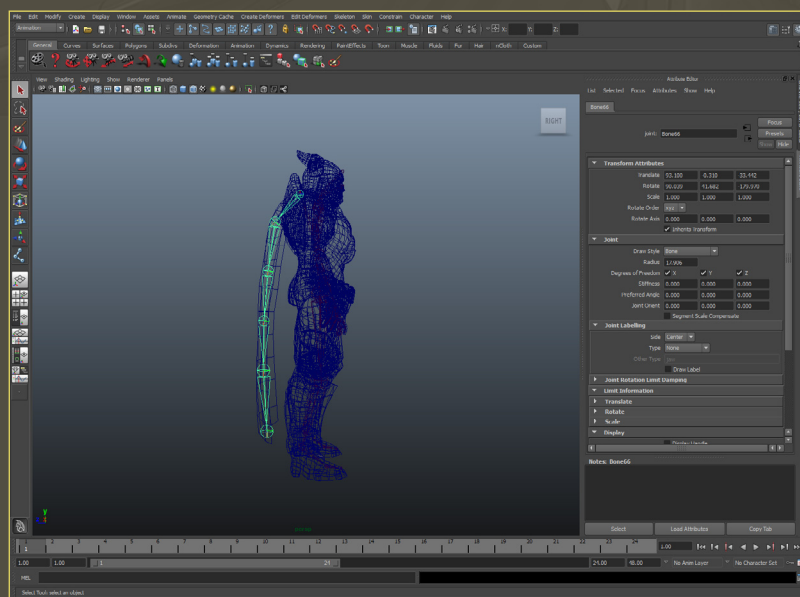
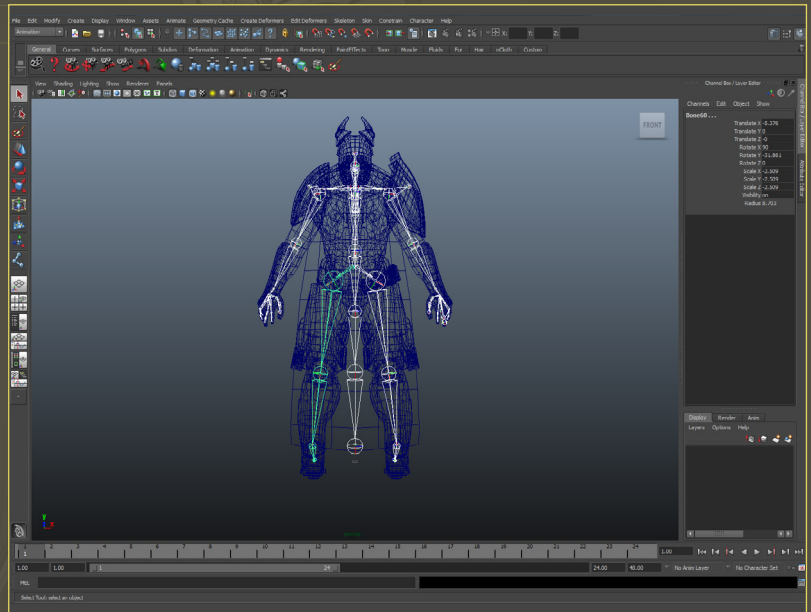


Fig 16

All we really need, at least for portfolio renders, is some slight deformation to get the starch out of the fabric (Fig.16).

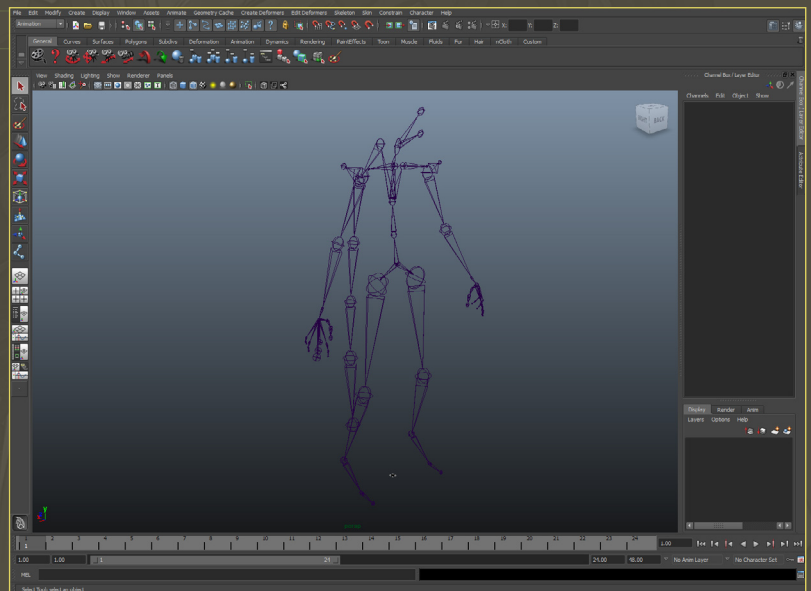
Finally add a single bone floating just above the upper arm bone to control the shoulder pads. Since these objects are completely solid I think it will be easier to have just one bone control them and nothing else, but have them follow the upper arm bone during movement (**Fig.17**).

Fig 17



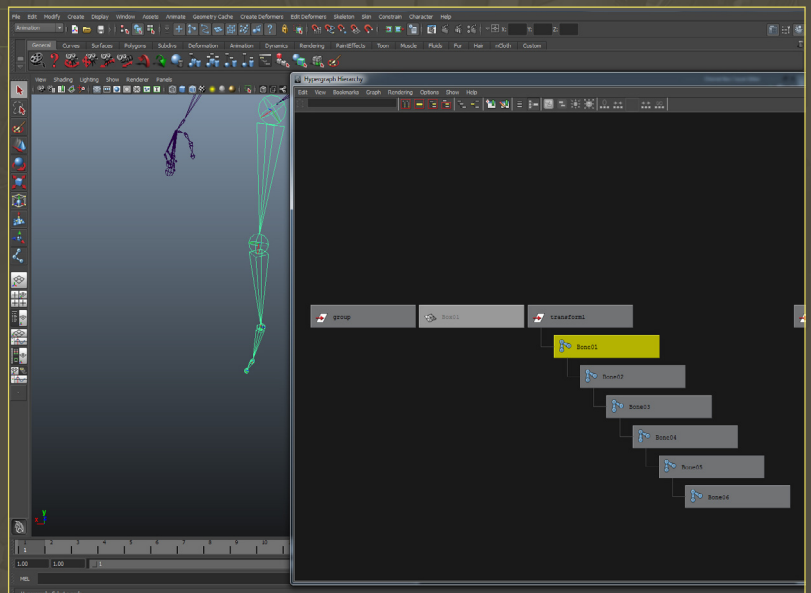
After hiding the character you will be able to see your character's skeleton in all of its glory. This is a good opportunity to check and make sure that you haven't missed anything before moving on to parenting and weighting (**Fig.18**).

Fig 18



Opening up the schematic view you can see that all of our chains and floating bones are listed separately. Much like a flow chart, a chain of bones is indicated by boxes being attached with arrows, the last bone being the final bone in the chain and the first bone being the root of the chain. Selecting a limb will help give a clearer vision of how the schematic view is laid out (**Fig.19**).

Fig 19



For my characters, everything basically stems from the pelvis, meaning that the pelvis is the center of gravity for my character.

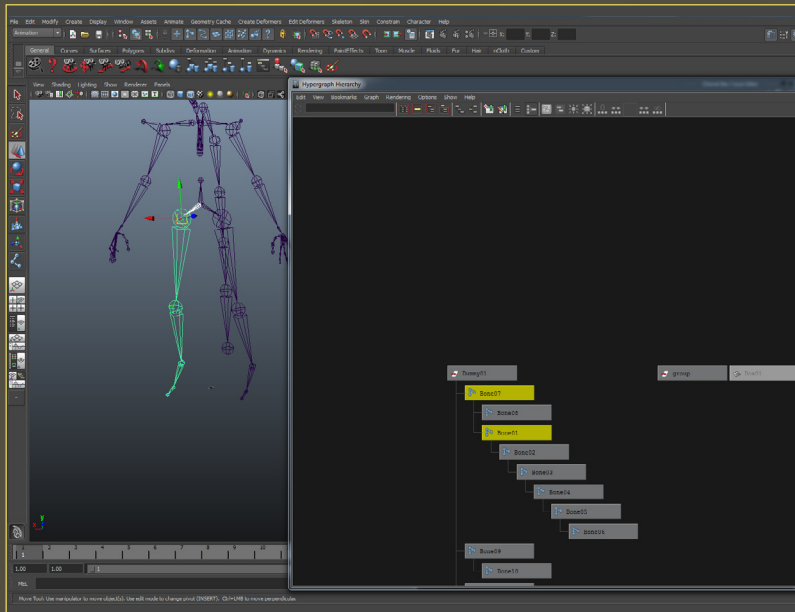


Fig 20

Using the Linking tool (the chain icon in the top left of the screen and the schematic view window), first select children bones and then link them to parents. So, working our way from the pelvis, the root of the right leg bone would be a child of the hip effector and the root of the foot bone would be a child of the leg effector at the ankle. When all of this is linked it means that we should be able to grab the leg effector and move it around with the foot following in place, as well as being able to grab the hip effector and move the entire leg as a whole (Fig.20).

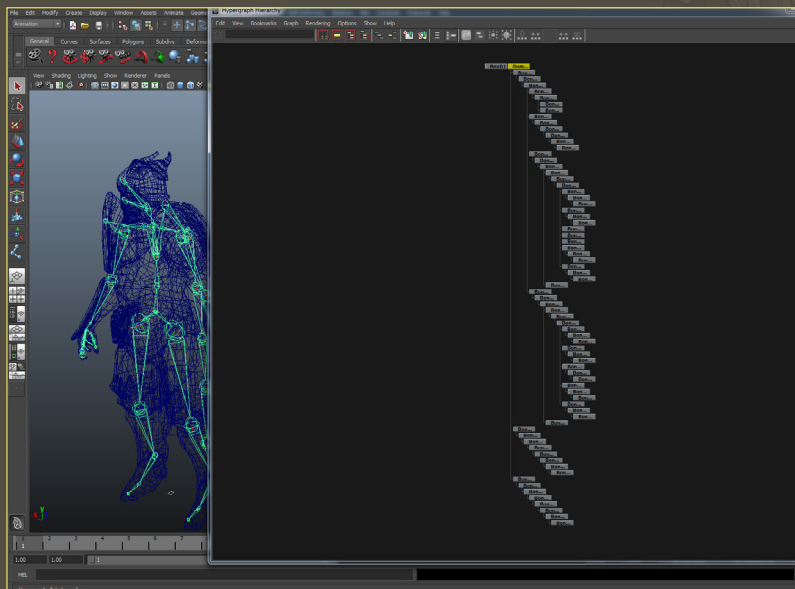


Fig 21

Now parent the fingers to the palm, the palm to the arm effector, the arm to the clavicle effector and the clavicle root to the spine effector. Also parent the shoulder pad bones to the upper arm bones and the head bone to the spine effector.

To finish off the rig create a dummy object, which can be another bone or an implicit object. This is essentially going to be culled out as no geometry will be weighted to it and, in some cases, will be ignored during an import to a game engine. Parent the root of the spine and the roots of both hip bones to this dummy object. So now you should be able to grab this object, move it around, and have your entire character follow suit (Fig.21).

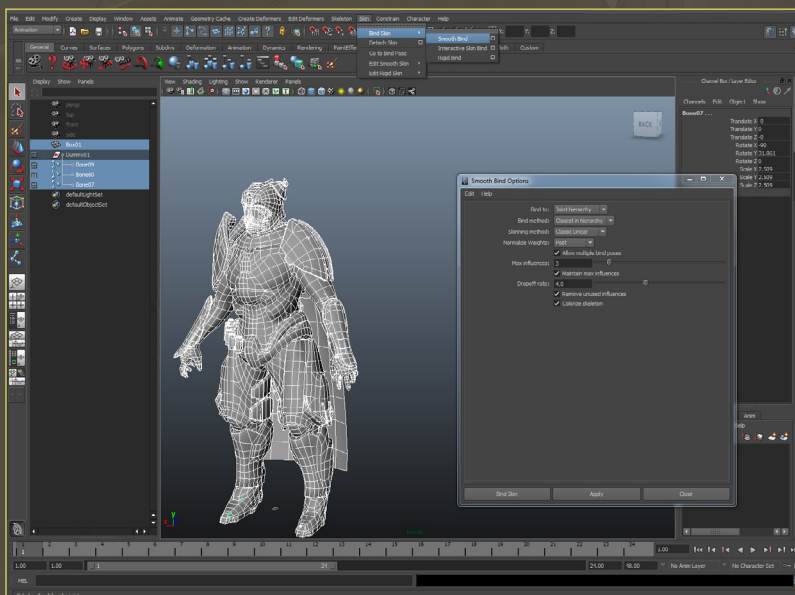


Fig 22

Now it is time to bind the character mesh to the skeleton that we have created. At this stage it may be wise to rename your bones so that they are easier to recognize as Bone32 can be confusing. Also to make weighting easier you could split off parts of the model that will have no influence over the rest of the character, like the shoulder pads and the cape. These pieces will essentially be free-standing elements and because of the constraints we have set up, will follow the character skeleton as a whole.

Select your character model and all of the bones you wish to use (which should be everything excluding the dummy object) and then navigate to Skin > Bind Skin > Smooth Bind Options (Fig.22).

Once the options window appears, lower the number of max influences to something more reasonable like 3 or 4. This means that three bones can influence a vertex at one time. Some consoles and engines will only allow a certain amount of bones to control a vertex, so it is good practice to keep this number as low as possible. Also, the more bones that can influence an area of the model can mean more minor adjustments and sometimes it is better to have a more crisp transition between one bone's influence to the other, like in the case of a forearm crashing into a bicep during deformations rather than having it bend smoothly.

Once the Smooth Bind has been applied, each vertex will be assigned a bone with varying influences. This is most likely messy as influences are grabbed by a global search. So, for example, vertices on the chest could be receiving influences from the arm bones. To edit these influences we will be using Maya's weight painting tool located in Skin > Edit Smooth Skin > Paint Skin Weights Tool (**Fig.23**).

Once the tool is activated an options panel should appear. The default settings should be fine, though at this stage I usually use a hard brush. To paint weights simply select a bone from the list in the Weight tool (selecting a bone should show what influence the bone has in real time) and then move the cursor over the model and click where you would like influence to be added. Of course, brush size and intensity can be adjusted to suit your needs.

To begin weighting, go through the character and rigidly weight areas to the bone it is closest to. Then move outwards and blend the influences from bone to bone. For the most part (as mentioned earlier) our character is fairly hard surfaced with a limited range of movement that is more or less isolated to joints and the character's midsection. That being the case, it will be acceptable to have some elements being fully weighted to just one bone with no influence from others such as the shin armor (**Fig.24**).

Fig 23

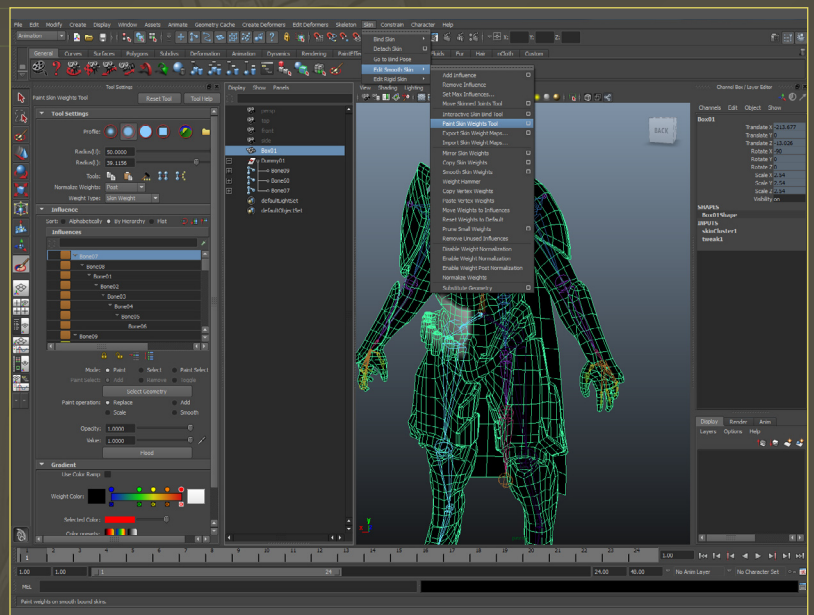


Fig 24

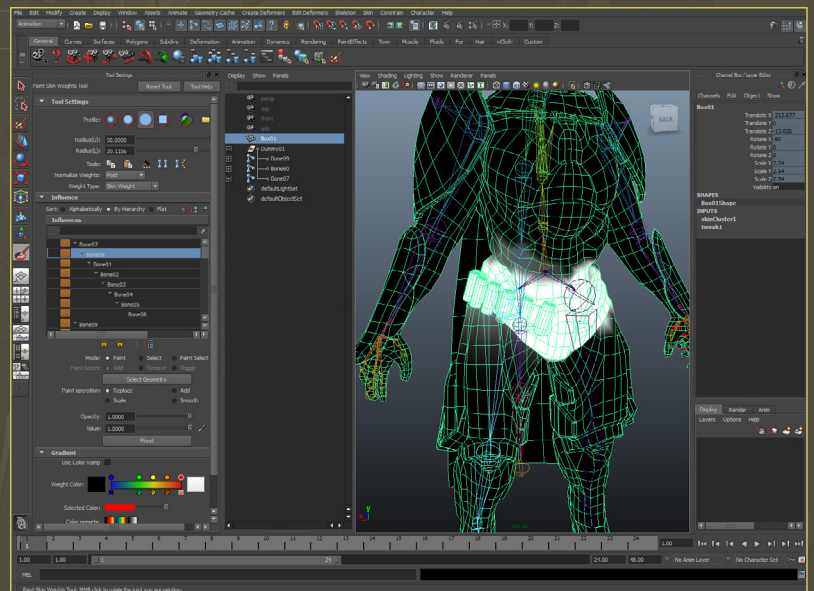
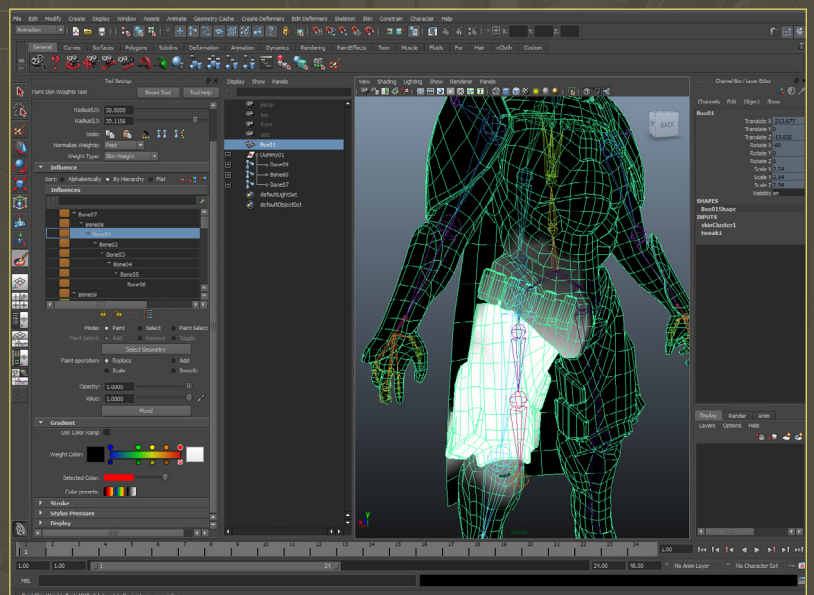


Fig 25



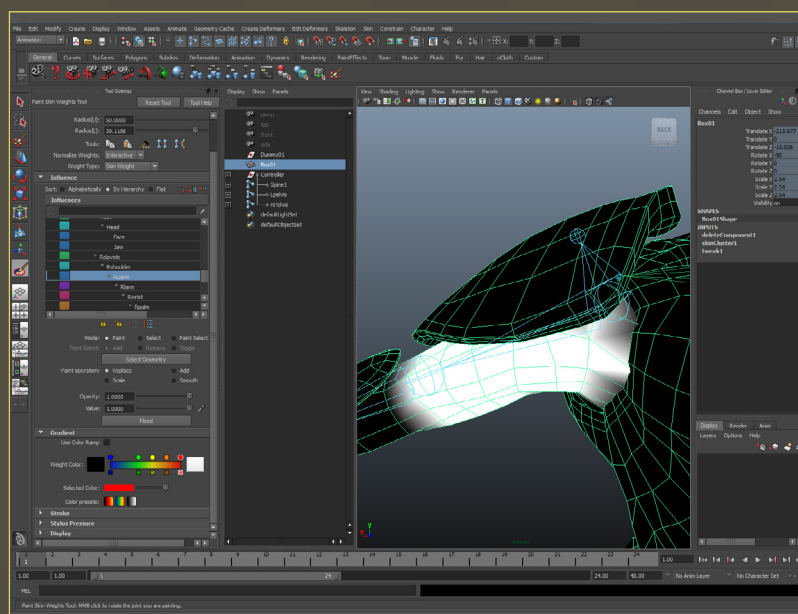


Fig 26

As mentioned above, a lot of the areas of our character can be rigidly weighted. For example, the upper leg armor of my character is fully weighted to the upper leg bone. For a smoother transition grab the vertices near the character's crotch and add influence from the hip bone and hip effector. The knee area is blended between the upper leg and lower leg bones. The lower leg is full weighted to the lower leg bone and the character's boot is blended between the heel and toe bones (Fig.25).

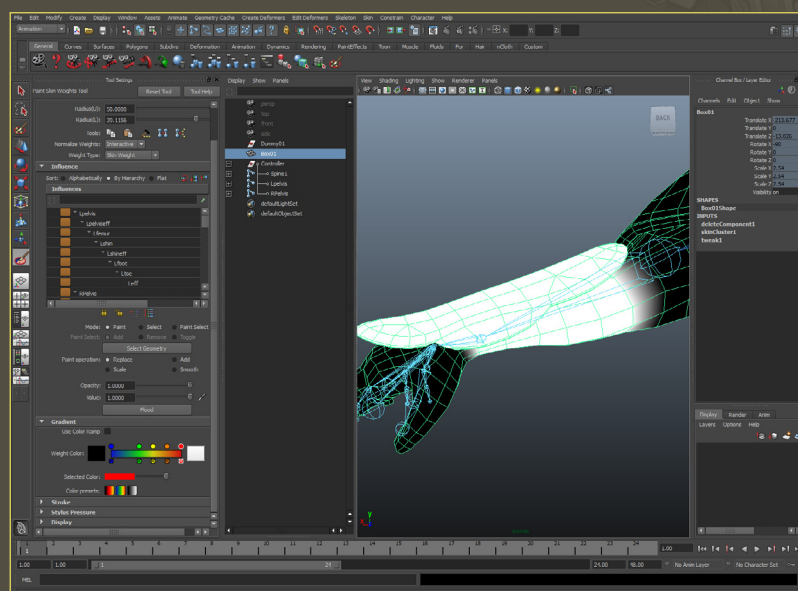


Fig 27

Tackle weighting the character's torso by rigidly weighting chunks to the closest spine bone. The majority of the torso armor is devoted to the third spine bone with the softer midsection being a blend between the first and second spine bones. The head and helmet are completely weighted to the head bone with mild influence from the neck and jaw bone for the more organic parts.



Fig 28

As mentioned earlier, the shoulder pads are fully weighted to the upper arm bones with the forearm armor being fully weighted to the forearm bone. For the softer, more organic parts, like the wrist and shoulders, blend to the adjacent bone. The upper arm, for example, will blend into the clavicle and top spine bone (Fig.26).

Moving down the arm, our character's wrist and elbow has a fairly even blend between the palm bone and upper arm bone. The character's fingers follow the closest bone fairly rigidly with blending at the knuckles (Fig.27).

Finally pose your character. I find that by creating a few different poses you can test the limits of our weighting, which inevitably leads to tweaking the weights as needed to have the character looking its best in the particular pose.

For portfolio presentation it's a good idea to play it fairly safe for your character's pose and deliver a neutral shot. This will help avoid any awkward deformations that could mislead the viewer into thinking something is wrong with your actual

model. For this example, I've dropped the arms, relaxed the legs a bit, made the cape not so uniform and twisted the spine and head to have the character looking at the camera (**Fig.28**).

After a few more tweaks, like adjusting the finger rotations and curl, pointing the toes to be more natural and removing the visor to show the character's face, you can bring in the Swordmaster's weapons for the final image (**Fig.29**).

For the final presentation I suggest using the Marmoset Toolbag (<http://www.8monkeylabs.com/toolbag>). I like to use the Toolbag as a quick model viewer and rendering solution due to its ease of use and focus on creating images for artistic presentation rather than full integration into a game engine. Many different features are available for post-processing effects and exporting a print-ready image is as easy as pressing one button. It also accepts OBJ files and many different image formats without the need for a complex shader setup. For the most part, this tool just allows you to jump in and have a professional quality rendered image within a few minutes. Of course, you can also use the Xoliul viewport shader covered in a previous chapter as an alternative.

The Toolbag allows you to create multiple materials for your character using the same textures. Because there are a few different physical materials within the Swordmaster character, split off pieces of the model to reflect this. These pieces are: the face and eyes (which will use a skin shader), the character body (which will use a standard phong material) and the weapons, which are a different texture set altogether.

Export all of the models together as one OBJ file. The different pieces will be recognized as chunks in the Toolbag (**Fig.30**).

Open up the Marmoset Toolbag and navigate to the File tab. Here you can open up a new mesh

Fig 29

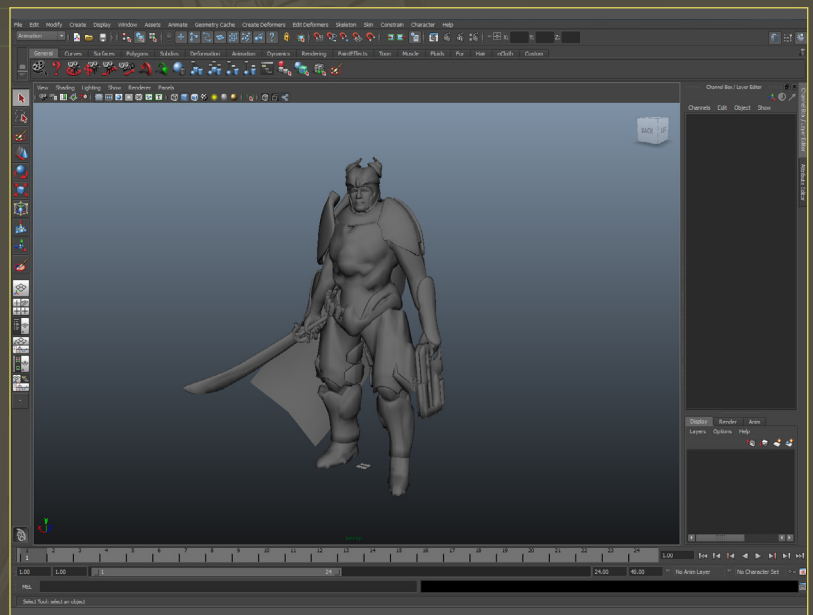


Fig 30



Fig 31



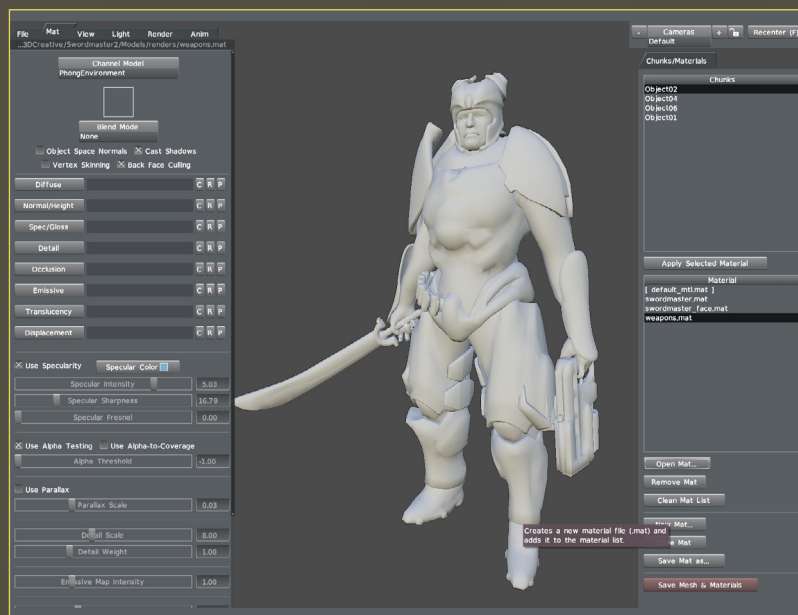


Fig 32

or if you have a scene previously created, open that scene. Click on the Open Mesh button and select the Swordmaster model you just exported from Maya (Fig.31).

The Toolbag applies a default material automatically on all of the models that are imported. So unlike other applications, material IDs and materials applied to the model during export have no effect. Creating materials is quick and easy and will basically be creating a duplicate of the default material that you can then modify and save as your own. Simply click on New Mat... and set the name of the file and where you would like the materials to be saved. If you click on Save Mesh & Materials at any time it will save both your model and materials and the material application to those models. To apply a material to your model, select the model (which will become outlined in white briefly) in the menu with a material selected and click Apply Selected Material. Once a material is active, it will be opened and closed by parenthesis.



Fig 33

I created three different materials, as noted before, for the face, armor and weapons (Fig.32).

Next, in the dropdown Channel Model menu, there are multiple types of materials you can choose from. As mentioned before, I am going to choose a phong material for the character's armor and weapons. This enables different texture slots including the usual Diffuse, Normal and Spec, as well as some other options such as emissive, which we will use for our glowing orange lights. Click on the name of the texture type and navigate to your texture map to load it into the Toolbag. C allows you to clear the field, R allows you to reload the texture and P brings up a map preview.



Fig 34

To see the single sided cape, disable Backface Culling. For all of the materials in this example you will also want to enable Cast Shadows (Fig.33).

Next enter the textures for the Swordmaster's skin material and change the shader type to SkinEnvironment (Fig.34).

Looking further down the list, you will notice that there are also different parameters that can be altered. In this case, I increased the specular power after enabling it and changed the color to a lighter blue. This helps sell the polished steel look (Fig.35).

Navigation is fairly straightforward in the Toolbag. Hold down Shift and use the mouse buttons to change the orientation of the sky, which will function as the scene's dominant light source. Hold down Alt and use the mouse buttons to move the camera and Ctrl with mouse buttons to move your model.

An important thing to note is that your Normal maps may be displayed inverted in the Toolbag viewport, depending on the settings you entered during texture baking. To fix this problem, navigate to the View tab and click the Invert Y radio button, which will essentially invert the green channel. To see this change, you will need to click Apply (Fig.36).

Switching over to the Render tab, you will notice that there are many different options for view modes. This can come in handy if you want to show your posed character with only one type of texture applied as a material breakdown to viewers. For example, it can be nice to show just the Diffuse, Normal and Specular maps separately and then the final composite (Fig.37).

Fig 35



Fig 36



Fig 37

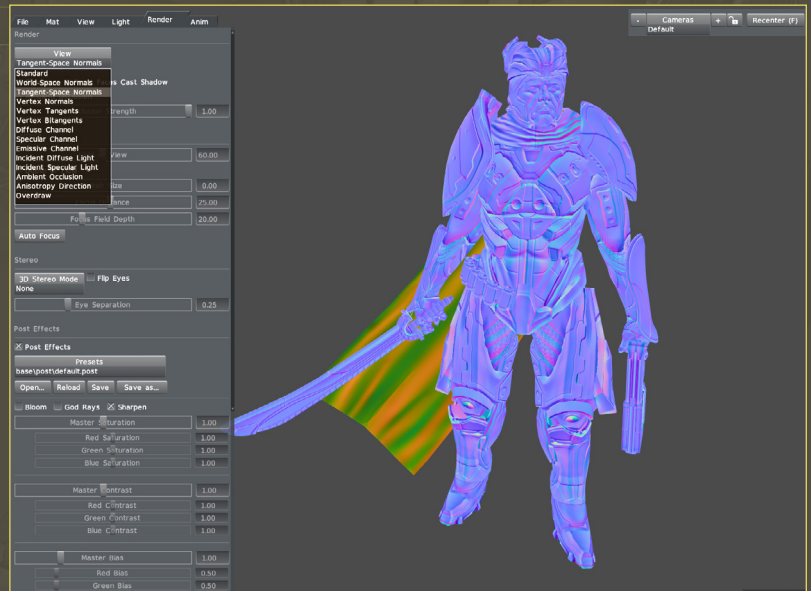




Fig 38

Scrolling further down the list in the Render section you can enable and adjust post-processing effects. Generally, these are things such as Bloom or Sharpening. You can also adjust the brightness, contrast and color balance for your final image. The Toolbag has many different presets to choose from ranging anywhere from your cliché brown, bloom-heavy Next Gen setting to less conventional, cinematic effects like Polaroid and Married to the Sea. You can play with these settings or create your own by adjusting the default settings. These post-processing effects can also be saved and loaded for other projects (Fig.38).

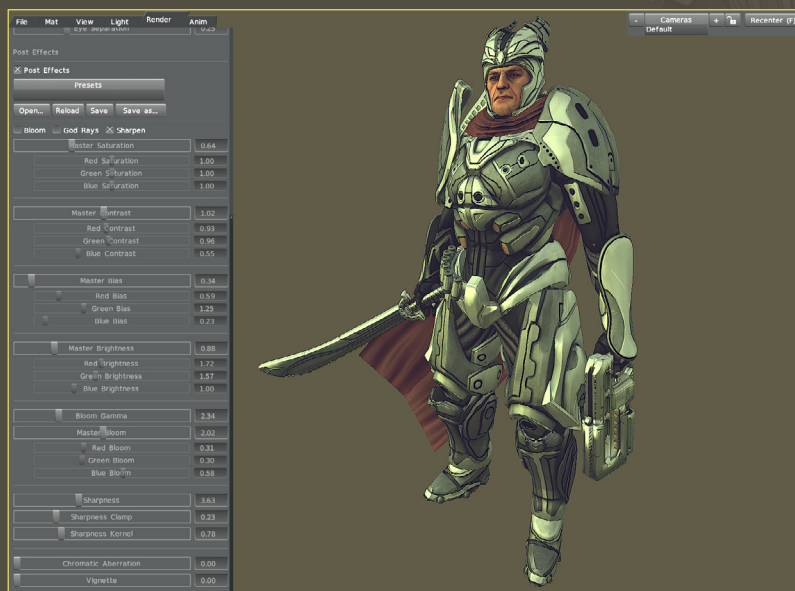


Fig 39

Select the Next Gen preset and begin tweaking the settings to better suit your needs. Generally update the sharpness of the image as well as some bloom values (Fig.39).

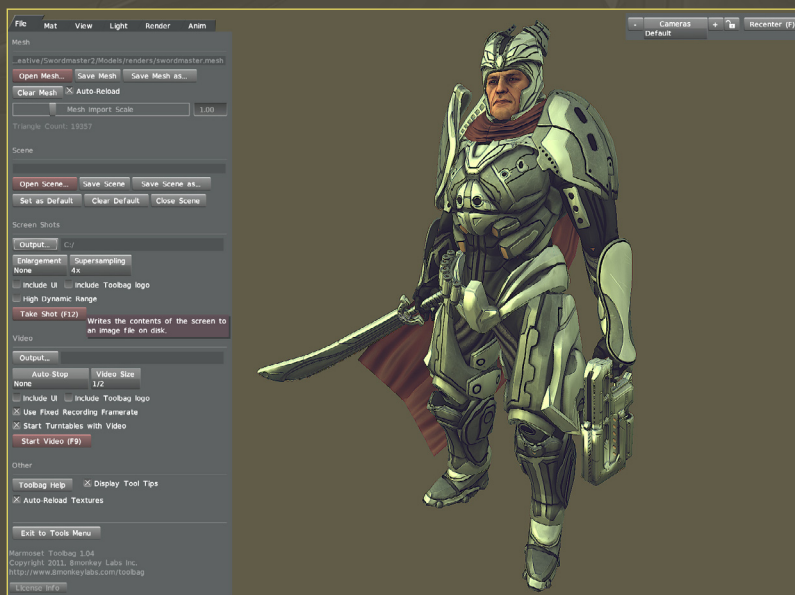


Fig 40

Finally, to export your image you can simply use print screen or, if you would like a higher resolution image that you can use for print or further alterations, navigate to the File tab again. Here you have the ability to adjust the image size by increasing the Enlargement value. Next, set your output folder and hit F12 to export an image. As a warning, depending on how strong your machine is, this function can fail if the image size is too large. So be sure to save your scene first (Fig.40).

Opening the screenshot you exported from the Toolbag in Photoshop, you can add color balancing layers for final tweaks to get your image exactly how you would like it. There really is no hard and fast rule here as every image can use different settings. Just feel free to play around with different adjustments until you are satisfied. I find that using the alpha channel exported with the image as a mask and applying Curves or Color Balance adjustment layers to pop out the highlights and shadows of the image really helps (**Fig.41**).

Fig 41



This is a perfectly fine place to stop! You have a great character with a presentation that shows the technical qualities of the model in a professional way with real-time rendering solutions. You can, however, move forward and create a beauty shot of your character as an addition that can use more external effects and a stronger action pose. I have created an action pose that has the Swordmaster character sailing into battle while firing off a few rounds at his opponent (**Fig.42**).

Fig 42



Here you can see the model using the same materials we had set up previously, with a different post-processing effect that pushes out the colder values in the image (**Fig.43**).

Fig 43





Fig 44

I applied a red color wash in the post-processing settings, altered the depth of field settings to focus on the center of the character and slightly blurred out objects further away (bullets, tips of the cape, the right foot, etc.,). I also applied a vignette effect, which shades out the far corners of the image (Fig.44).



Fig 45

You can also play around with different lighting effects. For my dominant light source, which is based on the sky setting, I chose Sunlight. By enabling Show Skybox this sky image will become visible. You can also add point lights, which I used as accents by clicking Add Light under the Dynamic Lights section. Once you create a light, you can alter its brightness and color as well as its position in the scene, which can be adjusted by interacting with the gizmo that appears over the light when its name is selected in the lights list (Fig.45).

Again I exported a screen shot (at 4x resolution which is big enough for magazine prints). Bring this into Photoshop and add a gradient near the bottom of the image to help ground the character and adjust the color balance just a touch (Fig.46).

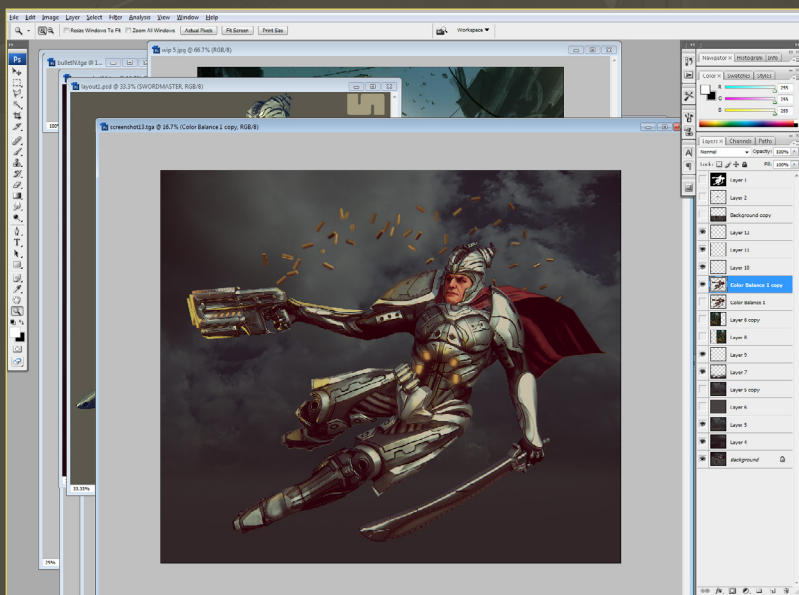


Fig 46

Here is where I cheated a little and added a few minor effects like boosting up the glow of the armor lights and smoke to the gun. Once I was happy with everything, I added some descriptive text and saved off the image and it was done!

GAVIN GOULDEN

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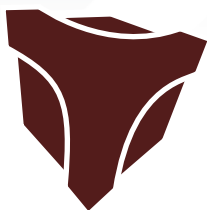
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